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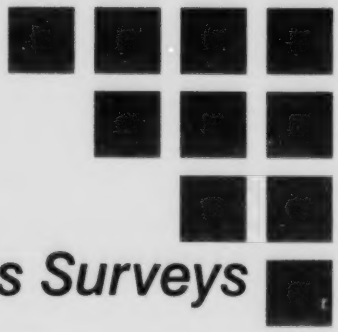


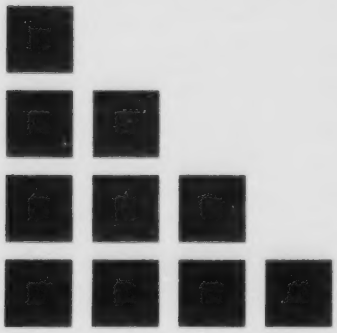
The National Graduates Surveys

The Trade-Vocational Educational Pathway in Canada:
1990 Trade-Vocational Graduates in the 1992 National Graduates and 1995 Follow-Up Surveys

R-00-1-6E

by
Daniel Boothby
February 2000

Research Paper



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This report is part of a set of research studies on the National Graduates Surveys. /
Le présent rapport fait partie d'un ensemble d'études sur les Enquêtes nationales auprès de diplômés.

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Printed/Imprimé 2000
ISBN: 0-662-29742-3
Cat. No./N° de cat. MP32-29/00-1-6E

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Abstract

This paper is a descriptive study of recent graduates from post-secondary trade-vocational programs in Canada. The study uses data from the 1992 National Graduates Survey (NGS) and its 1995 Follow-Up Survey to examine graduates who completed trade-vocational programs in 1990.

The definition of the trade-vocational level used in the NGS is examined and placed in its institutional context. This definition is compared to those used in other data sources on "trade-vocational education" or "trades education."

The characteristics of 1990 trade-vocational graduates and their labour market outcomes are then studied at an increasing level of detail. Trade-vocational graduates are first compared to community college career graduates and to graduates from university undergraduate programs. The characteristics and labour market outcomes of trade-vocational graduates are next examined for broad fields of study. Finally, these characteristics and outcomes are examined for detailed fields of study.

The portrait that emerges is one of extreme diversity among the various programs included under the heading of "trade-vocational" education. In general, trade-vocational graduates seem to have acquired skills which are useful to them in the labour market. The study concludes with suggestions as to how various levels of schooling, in particular the trade-vocational level, should covered by surveys, in particular the National Graduates Survey.

Résumé

Il s'agit d'une étude portant sur de récents diplômés de programmes de formation professionnelle postsecondaires au Canada. L'étude s'appuie sur des données de l'Enquête nationale auprès des diplômés (END) de 1992 et de son enquête de suivi de 1995 afin d'examiner la situation de diplômés qui ont terminé un programme de formation professionnelle en 1990.

La définition du niveau de formation professionnelle utilisée dans l'END est examinée et située dans son contexte institutionnel. Cette définition est comparée à celles que l'on trouve dans d'autres sources de données sur la « formation professionnelle » ou la « formation dans les métiers ».

Les caractéristiques des diplômés de la formation professionnelle de 1990 et leurs résultats sur le marché du travail sont ensuite étudiés avec un niveau de détail croissant. Ces diplômés sont d'abord comparés aux diplômés des cours techniques de niveau collégial et aux diplômés des cours universitaires de premier cycle, puis leurs caractéristiques et leurs résultats sur le marché du travail sont examinés dans des champs d'étude larges et, finalement, dans des champs d'étude bien définis.

Cette étude révèle une extrême diversité parmi les différents programmes que l'on classe dans la catégorie « formation professionnelle ». En général, les diplômés des cours de formation professionnelle semblent avoir acquis des compétences qui leur sont utiles sur le marché du travail. L'étude se termine par des suggestions sur la manière de couvrir différents niveaux de scolarité, particulièrement la formation professionnelle, dans les enquêtes, tout spécialement dans l'Enquête nationale auprès des diplômés.

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1. Introduction

This paper is a descriptive study of recent graduates from post-secondary trade-vocational programs in Canada. More precisely, this study uses data from the 1992 National Graduates Survey (NGS) and its 1995 Follow-Up Survey to examine graduates who completed trade-vocational programs in 1990.

The National Graduates Surveys (NGS) and the Follow-Up Surveys of the 1982, 1986, 1990 and 1995 cohorts of post-secondary graduates are the most important data resource available for research on outcomes of post-secondary education for Canadian graduates. Graduates at the trade-vocational level are an important part of the population of graduates in the NGS samples, accounting for 20% of graduates in each of the 1990 and 1995 graduating cohorts. This level represents an increase from the 16% of 1986 graduates who completed programs at the trade-vocational level, but a substantial decrease from the 27% of 1982 graduates who completed trade-vocational programs.[1]

Despite the fact that trade-vocational graduates are an important component of the flow of post-secondary graduates into the Canadian work force, we are not aware of any previous research which focuses on this group.[2] Given the limited resources available for this study, we decided to examine one cohort of trade-vocational graduates in depth, looking at the characteristics of these graduates at an increasing level of detail. We chose the 1990 cohort of graduates, because it is the most recent group for whom both an NGS and a Follow-Up Survey are available.

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1 These percentages are our calculations from Taillon, J. and Paju, M. (1998, Appendix 1) for 1995, Little and Lapierre (1996, Table A.2) for 1990, Clark (1991, Table J.1) for 1986 and Clark et al (1986, Table 1) for 1982.

2 Summary information on the trade-vocational level is available in the reports drawn from the various NGSs and Follow-Up Surveys. These are: for the 1984 NGS of 1982 graduates, Clark et al (1986), for the 1987 Follow-Up of 1982 graduates, Clark (1989), for the 1988 NGS of 1986 graduates, Clark (1991), for the 1991 Follow-Up of 1986 graduates, Bar-Telford et al (1996) and for the 1997 NGS of 1995 graduates, Taillon and Paju (1999). Some of the tables published in Little and Lapierre (1996) are very similar to material in our Chapters 3 and 4. There may be small differences in distributions between our tables and those of Little and Lapierre due to sample restrictions and due to the fact that we used the shared (Human Resources Development Canada) version of the combined 1992 NGS and 1995 Follow-Up microdata file while Little and Lapierre presumably used the master file (Statistics Canada) version of the 1992 NGS. A Human Resources Development Canada labour market information publication, *Job Futures* (HRDC, 1998), provides information on thirty-four of the forty-eight trade-vocational fields of study in the Canadian Occupational Projections System (COPS) field of study structure. Much of the information on trade-vocational graduates in *Job Futures* is drawn from the NGS. We have used the COPS field of study structure in this paper.

Because the characteristics of and outcomes for trade-vocational graduates differ greatly among fields of study, we thought it necessary to furnish considerable detail by field of study. Because very different definitions of "trades" education or "vocational education" are used in various data sources, we thought it necessary to review the definition of trade-vocational education used in the NGS and to compare this definition to those used in other data sources. We also try to set the definition of trade-vocational education used in the NGS within the institutional context that shaped this definition.

Chapter 2, then, discusses the institutional context that, in our view, led to the inclusion of a trade-vocational level in the NGS and how this context influenced the definition of the trade-vocational level in the NGS. The NGS definition of trade-vocational education is then compared to definitions of "trades" education and "trade-vocational" education used in other surveys.

Chapters 3 to 5 examine the characteristics of 1990 trade-vocational graduates and labour market outcomes for these graduates at an increasing level of field-of-study detail. In Chapter 3, we compare graduates from trade-vocational programs with graduates at the community college career level and university bachelor's degree level. In Chapter 4, we compare the characteristics of trade-vocational graduates from different aggregated fields of study. In Chapter 5, within the aggregated fields of study, we compare the characteristics of graduates from different detailed fields of study.

In Chapter 6 we draw conclusions from material presented in the preceding chapters. Among the issues considered in Chapter 6 is whether it is still worthwhile to include a separate trade-vocational sample in the NGS. The chapter also includes suggestions for further research.

2. What is Trade-Vocational Education?

This chapter discusses the concept of trade-vocational education used in the NGS and compares the NGS definition of the trade-vocational level of education to those used in other surveys. There is general agreement on what is meant by a university degree, diploma or certificate or a high school diploma. What exactly is meant by a "trades certificate" or a "trade-vocational certificate" is much less clear; and the definition appears to vary greatly among various data sources. For these reasons, we will examine the definition of "trade-vocational education" used in the NGS in some detail and draw out the differences between this definition and those used in other widely available data sources.

As concerns the concept of trade-vocational education used in the NGS, we are particularly interested in the distinction made between trade-vocational graduates and community college career graduates, since most trade-vocational graduates studied in community colleges, often in the same subjects as community college career graduates. The formal criteria used to distinguish trade-vocational programs from community college career programs are based on course duration and educational prerequisites.

In our opinion, however, institutional factors are at the origin of the distinction made in the NGS between these two types of programs.[3] More specifically, trade-vocational programs were programs that could be taken as federally funded "training," in community colleges or elsewhere, while community college career programs were provincially funded "education." Below, we provide a brief review of the aspects of the history of federally funded training programs and of the history of community colleges in Canada that we think are relevant to an understanding of the term "trade-vocational education" as used in the NGS.

[3] This view was suggested by Doug Giddings (personal communication). Doug Giddings was the director of the unit in Employment and Immigration Canada (later Human Resources Development Canada) which sponsored the NGS and Follow-Up Surveys during most of these surveys.

2.1 Training Programs, Community Colleges and the Trade-Vocational Level of the NGS

Training Programs and Community Colleges

Education is a provincial responsibility, but since early in the twentieth century the federal government has provided support for vocational training. Following the 1913 report of the Royal Commission on Industrial Training and Technical Education, the Technical Education Act of 1919 provided matching funds to stimulate vocational and technical training in the secondary schools. The Vocational Training Co-ordination Act (1942) "combined the policy of federal aid to education at the secondary school level...with provisions for training the unemployed."

The Technical and Vocational Training Assistance Act (1960) "continued the pattern of combining federal aid at the institutional level with assistance in training the unemployed." (Dupre et al., 1973, pp.14-17) According to Dennison and Gallagher (1986, 35) "access to federal funds through the Technical and Vocational Training Assistance Act (TVTA) was especially influential on the course Ontario colleges would take." These authors add (p.36) "The "instant" system of Colleges of Applied Arts and Technology in Ontario, with heavy and sustained emphasis on technical and vocational education, might never have materialized in the absence of federal financial support."

The Adult Occupational Training Act (AOTA) replaced the TVTA in 1967. The act represented a new approach to training, in which the federal government claimed a much larger role than before. This approach had been announced by Prime Minister Pearson at a Federal-Provincial Conference in October 1966. He justified the federal role in training as part of the federal government's responsibility to manage the economy. Training would provide adults with the skills needed to find jobs if unemployed or better jobs if employed. Training was distinguished from education in seeking only to develop job-related skills and in being provided only to adults, that is, persons who had left the educational system and entered the labour market.

The federal government would provide funds for capital costs of training institutions, purchase courses and provide allowances to trainees. The federal government would also select the persons to be trained and decide on the occupations for which they would train. In order to determine the appropriate occupations for training, the federal government would build "a highly

developed network of economic intelligence and analysis." "The whole purpose of the economic intelligence and analysis function was to provide finished information which, when returned to the CMCs [Canada Manpower Centres] would further enhance their role as the master clearing house of the Canadian labour market." (Dupre et al, 1973, p.50)

What Dupre et al refer to as the "federal grand design" was modified under pressure from the provinces. Several features of the training system which evolved are of interest to us. The maximum period of training was to be fifty-two weeks. The initial intention was that only courses which developed marketable job skills would be purchased. Following negociations with the provinces, educational upgrading courses, job readiness courses and second language courses were also included among the courses to be purchased. The "adults" who were to be trained originally were to have been persons three years beyond school-leaving age and three years in the labour force. In the 1972 revision of the AOTA, this definition was changed to persons one year beyond school-leaving age and one year out of school (not necessarily in the labour force). Obviously, this change made it far easier for youth to obtain trading.

The original intention was that the federal government would purchase training courses directly from public, non-profit and private institutions. In practice, the federal government entered into training contracts with the provinces that established the level of course purchases and the types of courses purchased. These contracts made it possible for the provinces to direct almost all purchases of institutional (classroom) training towards provincially-funded institutions, in particular, community colleges. As Dupre et al (1973, pp.127-128) point out, skills training courses in community colleges had educational prerequisites which could not be met by many potential trainees. They cite as an example that "of 120 skill courses in which the federal government purchased training places in 1969…no fewer than 76 required grades ten, eleven or twelve."

The institutional training system sketched above was first known as the Occupational Training for Adults program, then as the Canada Manpower Training Program (CMTP). It survived essentially intact through the replacement of the AOTA by the National Training Act in 1982 and the development first, of the Canadian Jobs Strategy (1985), then of the Canadian Labour Force Development Strategy (1991). From the start, most of the classroom training courses purchased

under this system were provided by community colleges and by other provincially funded educational institutions, such as schools of technology. In Quebec, both CEGEPs and adult education centres run by public school boards were important providers of training courses.

We have already noted Dennison and Gallagher's (1986) assessment of the influence of the TVTA on the development of Ontario's CAATs. They attribute (p.184) an even more important role to the AOTA. "Provincial legislation establishing many of the colleges came hard on the heels of the Adult Occupational Training Act and, in some provinces, the colleges quickly became centres for adult training using federal funds in what appeared to be provincially funded institutions. In fact, almost all public colleges in Canada depended heavily on Manpower-sponsored training programmes, complete with training allowances provided by the federal government to federally selected trainees."

Dennison and Gallagher (1986,70-72) list as the "common—but not universal" curriculum components of Canada's community colleges:

1. Vocational and trades training programmes of different but usually short duration, intended to lead directly to employment by graduates who would be job-ready.
2. Apprenticeship training programmes for those trades requiring this form of work preparation.
3. Career, technical and para-professional programmes of bewildering variety, of two or three years duration, intended to prepare graduates for employment at technical, mid-managerial, or professional assistant levels.
4. University transfer programmes...
5. General academic programmes...
6. Personal interest and community development programmes...
7. Pre-college level or upgrading programmes, or basic skill training.
8. Contract programmes.

Component 1 corresponds to skills training in an institutional setting as in the training programmes discussed above. Many or most of the courses in component 1 would be included in

the trade-vocational level in the NGS. Courses in component 3 correspond to what is referred to in the NGS as community college career programs and would be included in the community college level of the NGS. Note that components 1 and 3 are distinguished 1) on the basis of course duration and 2) in that component 1 is vocational and trades training while component 3 is career, technical and para-professional programmes.

Component 2 is the classroom part of apprenticeship training, which was also funded by federal training programs. These courses were not included in the NGS, perhaps because a separate apprenticeship survey counts apprenticeship starts and completions. Component 7 is basic training for skill development, which as noted above became eligible for purchase as federally funded training. These courses in component 7 are included in the Statistics Canada Trade-Vocational Survey (see below), but not in the NGS.

We close this section by bringing our very brief sketch of federal training programs up to the present. In our opinion, recent developments are relevant to whether it continues to be worthwhile to distinguish a trade-vocational level in the NGS. Two developments will be discussed here, both of which represent a retreat from the "federal grand design" discussed by Dupre et al.

The first development is that federally funded training increasingly has been limited to recipients of regular UI (later EI) benefits. While UI beneficiaries had always been an important part of the population of trainees, there has been an increased emphasis in the 1990s on limiting access to training to beneficiaries.[4] The second and more recent development is the negotiation of agreements with provinces to provide training services. Under these agreements, funds are transferred to the province, which selects the courses to be purchased and the persons to be trained. Agreements are presently in place with Alberta, New Brunswick and Quebec.

The Trade-Vocational Level, Skill Training Courses and the NGS

The first survey of post-secondary graduates to include a trade-vocational sample was the 1984 National Graduates Survey (NGS) of 1982 graduates. This survey was funded jointly by the

[4] On this point, see HRDC (1995), p x.

Secretary of State and Employment and Immigration Canada (EIC).[5] It would appear that one reason for EIC's involvement in the 1984 NGS was to ensure that trade-vocational graduates would be included in the survey.[6] All of the subsequent NGSs and Follow-Ups have been funded by EIC (or its successor, Human Resources Development Canada (HRDC)) and have retained the trade-vocational sample. The definitions of the trade-vocational, community college career and university levels of study have remained unchanged through the three subsequent NGS cohorts.

The sample selection criteria for the trade-vocational level in the NGS are discussed in detail below. For the moment, the definition given in the **Glossary** of the *Summary Report* for the 1984 NGS (Clark et al, 1986, p.178) will suffice:

> trade/vocational level—Skilled trade-vocational programs lasting 3 to 12 months, leading to a diploma or certificate and offered by a recognized community college, secondary school, technical or vocational school or college, school of nursing or similar institution. The following programs are excluded: basic training for skill development (BTSD) programs; programs such as language training, job-readiness, work-adjustment training, and occupational orientation.

The identification of trade-vocational courses with courses eligible for purchase by EIC as training programs is implicit in this definition. The limitation of course duration to 12 months or less coincides with the 12-month limit on the duration of training programs. The categories of courses excluded from the trade/vocational level are the course types in the Canada Manpower Training Program (CMTP) other than skill training and apprenticeship training. (Apprenticeship training is also excluded from the sample, as discussed below.)

It would appear from this definition of the trade-vocational level that course duration is the only difference between a trade-vocational program taken in a community college and a community college career program. In fact there is another difference—trade-vocational programs do not normally require high school completion (see section 1.2). Again, this was one of the criteria the federal government wished to establish for skill training programs.

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[5] An earlier (1978) Survey of 1976 College and University Graduates was funded by the Secretary of State, as was the 1973 Highly Qualified Manpower Survey. All of these surveys were conducted by Statistics Canada.

[6] Doug Giddings (personal communication) states that "The trades-vocational education component was added to the National Graduates Survey at the request of Employment and Immigration Canada (EIC) and EIC paid for the sample size enhancement required." Doug Giddings was the director of the unit in EIC (later Human Resources Development Canada) which sponsored the NGS and Follow-Up Surveys during most of these surveys.

The close relation between trade-vocational courses and skill training programs is also shown by the sampling frame for the trade-vocational level of the NGS. The sampling frames for the university and community college levels of the NGS are drawn exclusively from administrative records collected by Statistics Canada from universities and community colleges. For the trade-vocational level, administrative records collected from community colleges are supplemented by two other data sources. These are 1) EIC (later HRDC) files on skill training courses purchased by the federal government and 2) administrative records of graduations furnished by provincial ministries of education (to account for training courses purchased indirectly through the provinces or provided by provincially administered vocational institutions).

To sum up, the trade-vocational level of the NGS is probably best thought of as those courses given by community colleges and other institutions which were eligible for course purchase as skill training programs under the various federal government training programs. In our view, this institutional criterion underlies the formal sample selection criteria discussed in the next section. In fact, in the 1984 NGS, 65% of trade-vocational graduates had their course fees paid by EIC.

Suppose that we accept the view that the chief distinction between trade-vocational courses and community college career courses is that the former are courses eligible for purchase as training courses and the latter are not. Clearly one of our criteria for judging the continued relevance of a "trade-vocational level" should be the extent to which there continues to be a clear distinction in the courses given by community colleges between "training programs" and "career education." We will return to this point in Chapter 6, but turn for the moment to a detailed examination of the selection criteria for the trade-vocational sample.

2.2 Trade-Vocational Education in the NGS

As discussed above, the trade-vocational sample is drawn from three types of data sources. The first is administrative records of graduations collected from public post-secondary educational institutions covered in the annual Statistics Canada trade-vocational survey. These include community colleges, public vocational institutions, schools for nursing assistants and other special vocational schools. (See Statistics Canada, 1997 for a description of this survey). According to Oderkirk and Skof (1997, p.7) "most of the institutions included in Statistics

Canada's administrative surveys of trade-vocational training are community colleges and CEGEPs."

The National Graduates Surveys

The National Graduates Surveys (NGS), sponsored by Human Resources Development Canada and conducted by Statistics Canada, are specifically designed to obtain information on the relationship between education/training and labour market activities, the long-term labour market experiences of graduates, the employment, earnings, occupation and additional educational experiences and qualifications of graduates. The NGS focus on individuals who had obtained a degree, diploma or certificate from a trade/vocational school, a career/technical college (or CEGEP) or a university, and who were still living in Canada at the time of the survey. The NGS files are representative of the underlying graduate population in Canada.

Background

Statistics Canada conducted a first survey in 1978 on the labour market experiences of 1976 graduates from universities and community colleges in Canada. In 1984, a similar survey, the NGS of 1982 graduates was sponsored jointly by the Department of the Secretary of State and Employment and Immigration Canada and conducted by Statistics Canada. This survey expanded on the content of the previous survey and extended the population base to include graduates of trade/vocational programs in addition to graduates from community colleges and universities.

Since 1982, four cohorts of graduates have been surveyed. Every cohort was interviewed two and five years after graduation.

Year of graduation	First interview	Follow-up interview
1982	1984	1987
1986	1988	1991
1990	1992	1995
1995	1997	2000

The 2000 Follow-up Survey of the 1995 Graduates included a 'brain drain' component. Those who graduated in 1995 but who were living in the United States in June 2000 were included in the survey.

Objectives

The survey's key data objectives are:

- To obtain information for labour market analysis;
- To obtain information on the relationship between education/training and labour market experiences and the exposure of graduates to additional learning opportunities;
- To extend available information required to improve occupational supply and demand projection models and to conduct related studies of supply-demand imbalances in the labour market;
- To extend available information required to improve occupational supply and demand projection models and to conduct related studies of supply-demand imbalances in the labour market;
- To obtain data regarding longer-term market experiences of graduates;
- To gain a better understanding of post-secondary education financing;

- To obtain information on labour market experiences of members of target groups (such as women, visible minorities, native people, and persons with disabilities);
- To gain a better understanding of school-work transitions and returns to human capital;
- To obtain more detailed information on knowledge and skills.

Methodology

The National Graduates Surveys were based on a stratified systematic random sample design. For each province, the graduate population was stratified into five education levels: trade/vocational (skilled trades), career/technical (college), undergraduate, master's level and doctorate. The levels were subsequently stratified into nine fields of study for those who had taken a college program and ten fields for trade/vocational and university graduates. These fields of study classifications were based on the 5-digit USIS (University Student Information System) and CCSIS (Community College Student Information System) codes used by Statistics Canada. The sample allocation to the strata was made to assure acceptable levels of detail and therefore acceptable data reliability for the provinces, education levels and fields of study.

A total sample was selected for every cohort of graduates. Interviewers attempted to contact all graduates in the sample, initially using the telephone numbers provided by their institution. On average for every cohort, 73% of the total sample selected were contacted and interviewed. The same individuals were contacted again for the follow-up interview.

Year of graduation	Total sample selected	Year of survey	Usable sample (response rate)
1982	49,150	1984	35,717 (73%)
		1987	31,167
1986	53,136	1988	40,814 (77%)
		1991	35,401
1990	51,111	1992	36,280 (71%)
		1995	35,816
1995	61,759	1997	43,040 (70%)
		2000	To be completed

For more detailed information on methodology, see:

Clark, Warren, Margaret Laing and Edith Rechnitzer (1986). *The Class of 82: Summary Report on the Findings of the 1984 National Survey of the Graduates of 1982,* Secretary of State and Statistics Canada.

Clark, Warren (1991). *The Class of 1986: A Compendium of Findings of the 1988 National Graduates Survey of 1986 Graduates with Comparisons to the 1984 National Graduates Survey*, Employment and Immigration Canada and Statistics Canada, Catalogue LM-198E92.

Little, Don and Louise Lapierre (1996). *The Class of 90: A Compendium of Findings from the 1992 National Graduates Survey of 1990 Graduates,* Human Resources Development Canada and Statistics Canada, Catalogue SC-125-12-96E.

Taillon, Jacques and Mike Paju (1999). *The Class of '95: Report of the 1997 National Survey of 1995 Graduates*, Human Resources Development Canada and Statistics Canada, Catalogue SP-121-04-99.

The second data source for the trade-vocational file is administrative records from federal government training files. These files record training courses purchased directly by HRDC and its predecessor agencies. Some training courses were also purchased indirectly through the provinces, or were provided by provincially administered vocational institutions (which may be partially funded by the federal government). To account for these courses, the third data source for the trade-vocational file is administrative records of graduations furnished by provincial ministries of education (in particular, the Quebec ministry of education) for trade-vocational training institutions which are not covered by the Statistics Canada trade-vocational survey.[7] The potential sample drawn from these three sources is examined to eliminate duplications. There is also a screening question in the survey to assure that no individual is surveyed more than one time.

The base population of the NGS is the set of graduates from Canadian post-secondary institutions who "completed the requirements for degrees, diplomas or certificates during the calendar year 1990". (Statistics Canada, undated, p.7)[8] The trade-vocational (or skilled trades) level of the NGS sample is described as follows (p.7): "graduates of skilled trades (i.e. pre-employment) programs which normally were 3 months or more in duration."

Most persons in the trade-vocational sample graduated from community colleges. There is also a community college level of the NGS sample, described as (p.7):

> graduates of post-secondary programs (i.e. programs of one year duration or longer which normally require secondary school completion or its equivalent for admission) in the CAATs, CEGEPs, community colleges, technical schools, and similar institutions.

Thus there appear to be two criteria for distinguishing trade-vocational level programs given in community colleges from community college level programs given in community colleges: first, a program might be trade-vocational level rather than community college level because it does

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[7] The persons included from the Statistics Canada trade-vocational survey administrative records are completers in the pre-employment/pre-apprenticeship programs component of the survey (see below). The persons included from the federal government training files are sucessful completers of skill training courses. We have no explicit description of those included from provincial files. In the case of Quebec, they include persons completing skills training in adult education centres administered by local school boards.

[8] We have drawn this description of the NGS sample from the documentation for the combined file for the 1992 NGS and 1995 Follow-Up of 1990 graduates. The same concepts and methods were used for the 1982, 1986 and 1995 cohorts of graduates.

not necessarily require secondary school completion for admission; second, a program might be trade-vocational level rather than community college level because its normal duration is less than a year.

Following the definitions of levels quoted above, there is a set of exclusions. These appear to be intended to apply to the entire survey population, although all but b) are most relevant for the trade-vocational sample. (p.7)

> The population excludes:
>
> a) graduates from private post-secondary education institutions (e.g. commercial secretarial schools, commercial computer programming schools);
>
> b) those who completed continuing education courses at universities and colleges (unless these led to degrees or regular diplomas or certificates);
>
> c) those persons who took part-time trade courses (e.g. adult education evening courses) while employed full-time;
>
> d) persons who completed vocational programs
>
> i) lasting less than three months, or
>
> ii) other than in the skilled trades (e.g. basic training and skill development); and
>
> e) persons in apprenticeship programs.

An additional exclusion is that graduates of university transfer programs in community colleges are not included in the NGS college level sample. (Statistics Canada, undated, p.11)

A close look at the actual NGS sample shows that the definitions discussed above are not as clear in practice as they might appear to be in principle. For instance, graduates of private post-secondary education institutions are specifically excluded from the NGS sample. Statistics Canada's (undated) documentation for the 1992 NGS of 1990 graduates includes a complete list of the institutions from which the sample was drawn. (Appendix C, pp.273-291) At the college level, this includes entries which would certainly appear to be private institutions, for example, Institut Teccart Inc. (Quebec). The same is true for a smaller number of cases at the trade-vocational level, for example, Downsview Mall Mall [sic] Sackville (New Brunswick). The

trade-vocational level also includes graduates from programs where the institution is EIC T-VOC without INSTIT. #. It seems possible that some of these graduates were trained by private trainers.[9]

There are further interesting aspects of the list of training institutions. In Quebec, CEGEPs appear on both the college and trade-vocational lists, but what would appear to be private colleges, such as the Herzing Institute, Institut Teccart, College Delta, and so on, appear only on the college list. It is also surprising to find the Institut de tourisme et d'hotellerie on the college list, but not on the trade-vocational list. The presence of school boards (commissions scolaires) is a final aspect of the Quebec trade-vocational list which is worth mentioning. This occurs because in Quebec, school boards are responsible for adult education centres (centres de formation professionelle) which provide trade-vocational courses.

In various provinces, public community colleges appear on both the college and trade-vocational list, while certain specialized training institutions appear on the trade-vocational list only. Examples of these specialized training institutions include the Nova Scotia School of Fisheries, the Manitoba Technical Training Centre and the Pacific Marine Training Institute (British Columbia). There are a good many schools attached to hospitals on the community college list, but far fewer on the trade-vocational list.

While persons in apprenticeship programs are specifically excluded from the NGS sample (condition e) above), 3.7% of trade-vocational graduates were registered in an apprenticeship program at the same time they were enrolled in their trade-vocational program. Another exclusion is of persons who took part-time trade courses while working full-time (condition c) above). Some graduates at all levels were part-time students during all or part of their program of studies. In particular, 6.7% of trade-vocational graduates were part-time students throughout their program. No attempt seems to have been made to determine whether these graduates worked full-time during their course of studies and to exclude them from the sample if they did.

A final point concerns the duration of studies and the distinction between college and trade-vocational programs. College programs are supposed to require a year or more of studies, yet

[9] It seems likely that the Downsview Mall and the EIC T-VOC programs were added from the training files, rather than being drawn from educational institution administrative files.

10% of college graduates said that their program required 3-12 months of study.[10] Among trade-vocational graduates, 15% stated that their program required more than a year to complete. These programs might nevertheless have been trade-vocational level programs because secondary school graduation was not a condition of enrolment. If so, it is not clear how it was established that the program did not require secondary school graduation.

A useful example of the difficulties of distinguishing the trade-vocational and college levels is provided by the other nursing field of study in the Canadian Occupational Projections System (COPS) field of study aggregation. This field of study exists at both the trade-vocational and college levels. At the trade-vocational level, 31% of 1990 graduates in other nursing have course durations of more than one year. The educational level before enrolment of 99.4% of these graduates is a high school diploma or more. In fact, before enrolment 52% of these graduates have a college diploma or certificate (presumably in nursing, since most work as registered nurses). Thus in terms of the NGS criteria discussed above, it seems that many trade-vocational level other nursing graduates would more appropriately be classified as community college level other nursing graduates.

In any large population survey, there are likely to be various ambiguities concerning the sample selection criteria and persons included in the sample who appear not to meet these criteria. It is useful to be aware of these difficulties in examining the trade-vocational level in the NGSs and Follow-Up surveys. In particular, one should be aware that the distinction between the trade-vocational level and the community college career level is less clear than it might seem.

2.3 Definitions of Trade-Vocational Education in Other Data Sources

Other Definitions of Trade-Vocational Education

Since all of the material we present on trade-vocational graduates is drawn from the 1992 NGS and 1995 Follow-Up of 1990 graduates, we could have limited ourselves to discussing the

[10] An anonymous Statistics Canada reviewer suggests that these may be programs which formerly were trade-vocational programs, but which now require secondary school completion, leading to their inclusion in the community college level. Nonetheless, the definition of the community college level in the NGS quoted in the text seems to state clearly that inclusion of a program at this level requires **both** a course duration of 12 months or more **and** a prerequisite of high school completion.

definition of trade-vocational education used in the NGS. We instead have chosen to compare this definition with those used in other data sources for two reasons.

First, as we state in the *Introduction*, there is very little published analysis of data on trade-vocational education in Canada. Since one of the purposes of this study is to begin to fill this gap, we thought it useful to review the various data sources on trade-vocational education. Second, one of the themes of this paper is the diversity of the programs of study which are grouped under the heading of trade-vocational education. A striking illustration of this point is provided by the differences in the definitions of trade-vocational education used in various data sets.

These are not simply differences in implementing a definition which is the same in principle in all surveys. When different surveys enumerate university graduates or high school graduates, there is agreement in principle as to what constitutes a university graduate or a high school graduate. This is not the case for trade-vocational graduates. We are forced to compare the operational definition of a trade-vocational graduate used in different surveys if we seek to understand who is in principle a trade-vocational graduate in each survey. For this paper, the most important definition of a trade-vocational graduate is obviously the definition used in the NGS, so we began with this definition. We now compare the NGS definition of trade-vocational education with those used in three other data sets: the trade-vocational survey, the Census and the Labour Force Survey.

The Trade-Vocational Survey and the NGS

Apart from the NGS, the most important data source on trade-vocational education in Canada is the Statistics Canada trade-vocational survey. Most of the trade-vocational sample of the NGS is drawn from the administrative data collected from educational institutions for the trade-vocational survey.

Information on the annual trade-vocational survey is available in a number of published Statistics Canada sources.[11] In what follows, however, we will draw principally on an unpublished

[11] See for example Skof (1994b) and Statistics Canada (1997). Information on trade-vocational enrolments and completions is published regularly in *Education in Canada* (Statistics Canada, 1975-) and was previously published in Statistics Canada (1979-March 1994) and in Statistics Canada (1959-1977).

Statistics Canada report (Oderkirk and Skof, 1997) as it specifically concerns the relation between the trade-vocational survey and the NGS.

The trade-vocational survey "collects information from institutions providing trade-vocational programs on both enrolment levels and numbers of graduates. For these administrative surveys, trade-vocational education is defined as the education and training that prepares an individual for an occupation requiring skills and knowledge for well-defined procedures using tools, machinery, instruments or equipment. Trade-vocational training differs from technical training because there is more emphasis on the manipulative skills of an occupation than on theoretical content." (Oderkirk and Skof, 1997, p.5)

The concept of trade-vocational education used in the trade-vocational survey is much broader than the concept used in the NGS. It includes eight components:

1. pre-employment/pre-apprenticeship programs
2. registered apprenticeship programs
3. skill-upgrading programs
4. special training and other programs
5. pre-vocational academic upgrading or basic training for skill development programs
6. language training programs
7. job readiness training programs
8. orientation programs

The first four of these are trade/vocational training programs; the last four are preparatory programs. (Skof, 1994, Table 1). These eight program components will be easily recognized as the components of federal government institutional training programs. According to Oderkirk and Skof (1997), only the first of these eight components, pre-employment/pre-apprenticeship programs matches the NGS definition of a trade-vocational program. (p.6a)

Oderkirk and Skof state that while in the past trade-vocational programs did not require a grade 12, the preferred requirement for entry into a pre-employment/pre-apprenticeship program, in most provinces, is now grade 12 or equivalent. In Quebec, where (according to the authors) trade-vocational training is not offered in post-secondary institutions, the grade 12 requirement

does not apply. The authors state that trade-vocational programs are now predominantly offered in community colleges. As a result, most of the institutions included in Statistics Canada's administrative surveys of trade-vocational training are community colleges and CEGEPs. (p.7)[12]

The report also comments on issues of course duration. It notes that some trades requiring mandatory apprenticeship training have lengthened their one year pre-apprenticeship course requirement to two year technician diplomas. They give nursing assistant programs in Ontario as another example of a course where program duration has increased (from two semesters to three semesters). Consequently, programs previously included in the trade-vocational level of the NGS may now be included in the community college level. They also note that some one year courses leading to a certificate serve as a foundation program for a two or three year program. (p.8) Oderkirk and Skof conclude that "it may be more appropriate to label NGS trade-vocational graduates as graduates from college short programs and NGS career-technical graduates as graduates from college long programs." (p.10)

Trade-Vocational Education in the Census and the Labour Force Survey

Two other data sets—the Census and the Labour Force Survey (LFS)—can be used to provide estimates of the total number and the characteristics of trades graduates.[13] Both of these population surveys ask questions on the educational attainment of persons in their sample. In both surveys, the respondent is asked whether the person in question has a trades certificate or diploma. The respondent is left to decide whether a particular post-secondary qualification is a trade-vocational certificate or diploma or a college certificate or diploma or something other than these options. The responses given are not likely to match the NGS criteria for trade-vocational certificates and diplomas in all cases, as discussed below.

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[12] It is somewhat difficult to reconcile the two statements on the same page that on the one hand Quebec does not offer trade-vocational courses in post-secondary institutions but on the other hand CEGEP's are included in the trade-vocational survey. There are certainly many CEGEP's in the sampling frame for the trade-vocational level of the NGS.

[13] The Census regularly publishes data on the highest degree, diploma or certificate which includes "trades certificate" as one of the categories of educational attainment. The LFS does not identify "trades, vocational or apprenticeship certificate" as a category of educational attainment in published data. This data presumably could be obtained by special tabulations. The same applies to the Survey of Consumer Finance, which uses the LFS educational attainment data. There are other surveys which we do not discuss which also furnish information on some aspect of trade-vocational education, for example, the Adult Education and Training Survey and the Apprenticeship Survey.

First, in both the Census and the LFS, holders of trades certificates are likely to include persons who obtained a certificate by completing an apprenticeship. The NGS sample explicitly excludes apprentices.

Next, the Census and the LFS definitions of trades certificate are likely to differ from the NGS with respect to course duration. In the past, the Census has published data on the duration of non-university education (other than primary and secondary education) of persons with non-university certificate or diploma. In the 1981 Census, there were 2,038,125 persons with a trades certificate or diploma and no other non-university certificate or diploma and another 230,975 persons with both a trades certificate or diploma and another non-university certificate or diploma. Of those with a trades certificate or diploma only, only 18% had less than one year of completed non-university courses, another 16% had one year of completed courses, and the remaining 66% had more than one year of completed courses.[14] (Statistics Canada, 1984, Table 6) This is quite different from the concept used in the NGS of trade-vocational education as limited to at most 12 months of study. It is also very different from the actual distribution of trade-vocational course durations in the NGS.

Since a major revision of its methods of collecting educational levels in 1990, the LFS has collected information on whether respondents hold a trades, vocational or apprenticeship certificate. (See Gower, 1993, from which this discussion is drawn.) Prior to 1990, respondents were asked the number of years of primary and secondary schooling they had completed. They then were asked if they had post-secondary education and if this post-secondary education normally required high school graduation. Only if the respondent answered yes to both of these questions were they coded to one of three post-secondary levels.

Beginning in 1990, an item on high school graduation was added, the condition that post-secondary education normally require high school graduation was dropped, and the number of post-secondary levels was increased to six, one of which is a trades, vocational or apprenticeship certificate. The result was a 64% increase in the total of non-university certificates and diplomas.

[14] We cite figures from the 1981 Census because tables at this level of detail have not been published for more recent Censuses, to our knowledge.

According to Gower's figures, 27.9% of persons 26-65 years old in 1990 with a trade certificate or diploma were not high school graduates (computation from Table 1, p.4). He notes that part of the increase in post-secondary, non-university certificates and diplomas may be due to individuals reporting short-term training such as five-day word processing courses as a trades certificate or diploma. In this respect, it is significant that Gower finds that when respondents are linked between the December 1989 and January 1990 samples, only 40% of persons with trades certificates in January 1990 reported a non-degree post-secondary certificate in December 1989.[15] Thus the present concept of a trades certificate or diploma in the LFS differs from the concept in the NGS, which specifically excludes certificates or diplomas where the normal course duration is less than three months.

From this brief discussion of the trade-vocational level in the Census and in the LFS we note the following: The concept of trades certificate or diploma in the Census and in the revised LFS does not require high school graduation. Neither specifically excludes courses of less than three months duration as leading to a trades certificate or diploma. In the case of the LFS, it seems probable that courses of less than three months duration are included. The Census may also include short-duration courses. Where published data is available (most recently, in 1981), the Census also shows that many persons with trade certificates took courses of more than a year's duration. Some of these programs might well have been classed as college programs in the NGS.

2.4 Summary

We began this chapter by describing the institutional setting that, in our view, underlies the concept of trade-vocational education used in the NGSs and Follow-Up Surveys. The trade-vocational level in these surveys essentially consists of programs which were eligible for course purchase as skills training under the institutional component of federal training programs.

We then examined in some detail the operational definition of trade-vocational education used in the NGSs and Follow-Up Surveys. One point of particular interest to us is the difference between

[15] Some of the 60% of persons with trade certificates in January 1990 who did not have non-degree post-secondary certificates in 1990 are no doubt persons whose programs did not require high school. If one assumes that these persons are 30 percentage points of the 60 percentage point difference (since persons who are not high school graduates are 27.9% of those with a trades certificate in 1990) this leaves 30% of persons with trades certificates in January 1990 unaccounted for, many of whom are likely to be persons who are reporting short courses.

the trade-vocational level and the community college career level. We find that in practice the distinction between these two levels is less clear than it appears to be in principle.

Next, we compared the definition of trade-vocational education in the NGS to those used in three other surveys: the trade-vocational survey, the Census and the LFS. The trade-vocational survey counts enrolments and completions in a much wider range of trade-vocational courses than the skill training courses in the NGS trade-vocational level. The courses covered in the trade-vocational survey correspond to all of the course types included in federal institutional training programs; the NGS trade-vocational level includes only skill courses of 3-12 months duration.

The Census and the LFS identify respondents as having a trades certificate as their highest completed level of schooling. Unlike the NGS, this schooling may include courses which are shorter than 3 months or longer than 12 months and courses for which high school graduation is required. It may also include apprenticeships, which are excluded from the NGS.

Thus the operational definition of trade-vocational graduates or trades graduates varies considerably among the four surveys considered (NGS, trade-vocational, Census, LFS).[16] Even within the fairly precise definition of trade-vocational education used by the NGS, there are ambiguities in definition and there are persons in the sample whose presence it is difficult to reconcile with the criteria for inclusion in the sample. Many of the difficulties in the NGS sample may be due to the great diversity of the trade-vocational education systems in the various provinces and territories.[17]

Oderkirk and Skof (1997) have a good deal to say about the evolution of trade-vocational education over time. One conclusion we would draw from their discussion is that apparent changes in the NGS trade-vocational sample in, for example, the number of trade-vocational graduates or their field of study, may be due in part or in whole to institutional changes which

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[16] We have certainly not exhausted the list of operational definitions of trade-vocational education. For example, the Canada Student Loans program includes vocational programs in the list of types of post-secondary programs for which loans may be granted. The institutions whose students are eligible for loans are designated by the provinces (except Quebec, which has opted out of CSL). These institutions include many private training institutions which provide training in a wide variety of fields, e.g., dog grooming.

[17] For example Jones (1997) traces the evolution of vocational training and of community colleges province by province, showing the diversity of these systems among the provinces and the close relation in many cases between community colleges and vocational training. Paillé (1998) shows the complexity of the vocational training system within a single province, Quebec.

lead to including graduates in the college level sample in one NGS who would have been found in the trade-vocational level sample in another NGS. Due to these changes, it may be difficult to compare the data on trade-vocational graduates among the different NGS cohorts.

In Chapter 6, we make recommendations as to what we consider an appropriate framework for classifying post-secondary educational programs into levels. For the moment, we will simply remark that data from the NGS on trade-vocational graduates cannot easily be compared to data on trade-vocational education from other sources.

3. Trade-Vocational Graduates in the Post-Secondary System

The preceding chapter discussed the difficulties involved of defining what constitutes trade-vocational education in Canada and presented the concept of trade-vocational education which has been implemented in the National Graduates Surveys (NGS). This chapter seeks to situate trade-vocational graduates in the context of the post-secondary educational system by comparing them to graduates at the community college and bachelor's degree levels.

The data for the tables and charts in this chapter are drawn from the 1992 NGS of graduates in 1990 and the 1995 Follow-up of Graduates (FOG) of the 1990 cohort. The 1990 cohort is the most recent graduate cohort for which both an initial survey and a follow-up survey are available. Some of the material presented here parallels the contents of the Statistics Canada reports on these two surveys. (Little and Lapierre, 1996, Paju, 1997).[18] Our emphasis, however, is on pointing out how trade-vocational graduates differ from other post-secondary graduates.

Age, Gender, Visible Minority Status and Region

We begin by comparing the age, gender, visible minority status and regional distributions of post-secondary graduates at the trade-vocational, community college and university bachelor's degree levels.[19] Figure 3.1 gives the distribution of age in June 1990 of 1990 graduates at each of these levels. The figure shows a very strong concentration of BA graduates in the 22-27 years age range and of community college graduates in 20-24 years age range.

The ages of trade-vocational graduates are far more evenly distributed across the age groups shown in the figure. A somewhat larger proportion of trade-vocational graduates than of community college graduates is found in the youngest age group, those 19 years old or less in June, 1990. While a substantial proportion (about 20%) of both community college graduates and university BAs were 28 or more years old in June, 1990, around 45% of trade-vocational graduates were in this age group.

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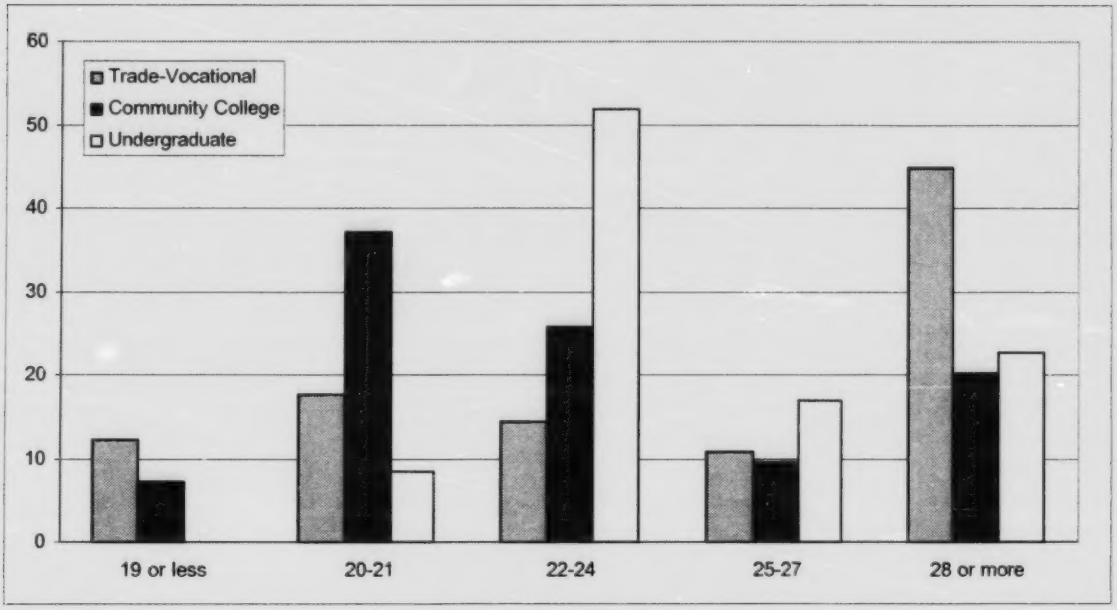
[18] In some instances, our results may differ slightly from results reported in these publications, due to small differences in choice of sample, construction of variables, etc.

[19] The community college level is limited to community college career programs in the NGS sample. The bachelor's degree level as we use it here includes first professional degrees. We use the terms bachelor's and first professional degree, undergraduate degree and BA degree as if they were synonomous.

Figure 3.1 **Age Distribution of Graduates in June 1990**



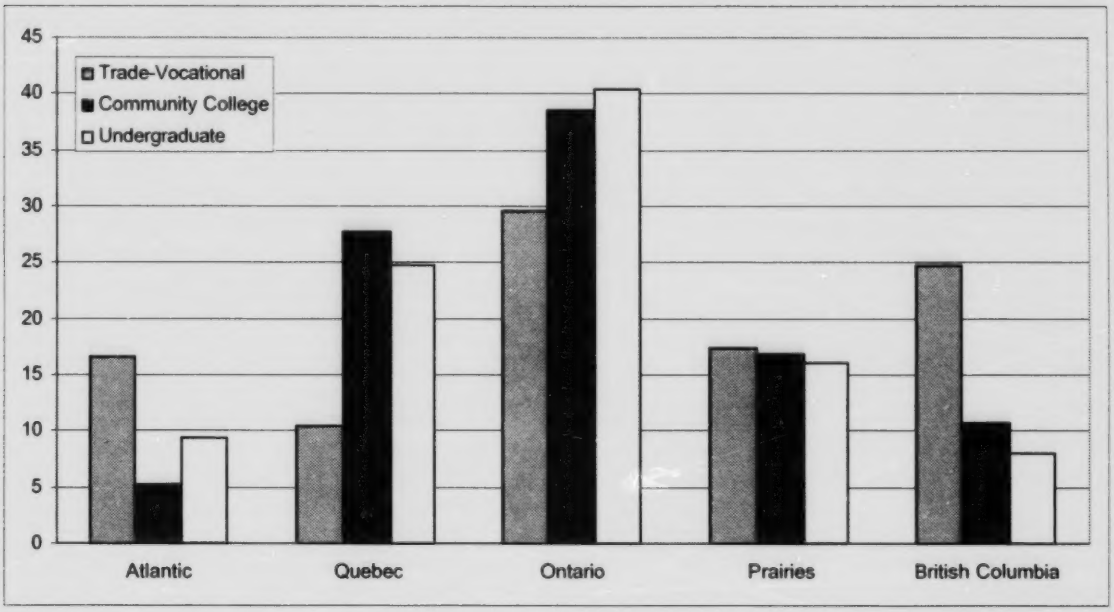
Community college and BA graduates are thus predominantly young persons. Probably because their course of study is longer, BA graduates are somewhat older than community college graduates. Trade-vocational graduates are drawn from a much broader age range, with almost half of them more than 28 years old in June 1990, and 17% of them 38 or more years old at this date.

Women are 52% of 1990 trade-vocational graduates, 59% of community college graduates and 57% of university bachelor's degree graduates. Women are thus the majority of graduates at all three levels, but their predominance is weakest at the trade-vocational level. As we shall see below, the trade-vocational level is also characterized by a very high degree of concentration of women in predominantly female fields of study and of men in predominantly male fields of study.

Members of visible minorities are 14% of 1990 trade-vocational graduates, somewhat more than the 10% of community college graduates and 10% of university BA graduates made up of members of visible minorities.

The regional distribution of graduates prior to enrolment is shown in Figure 3.2. The distributions of community college and university graduates are roughly similar, except for the Atlantic region, where there are only half as many community college as university graduates. The most striking feature of the figure is, however, the differences between the geographic distribution of community college and university graduates on the one hand, and trade-vocational graduates on the other hand.

Figure 3.2 **Distribution of Graduates by Region of Residence before Enrolment**



Over 15% of trade-vocational graduates resided in the Atlantic region and over 25% resided in British Columbia. These two extremities of the country thus account for over 40% of trade-vocational graduates, compared to around 15% of community college graduates and 17% of BAs. Ontario has a lower share, and Quebec has a far lower share, of trade-vocational graduates than of community college graduates and BA graduates. (The lower representation of trade-vocational graduates in Quebec may in part be due to the data collection difficulties discussed in the first chapter.)

Activity and Schooling before Enrolment

Figure 3.3 shows the major activity of graduates during the twelve months preceding enrolment in their program. Over 50% of trade-vocational graduates had work as their major activity;

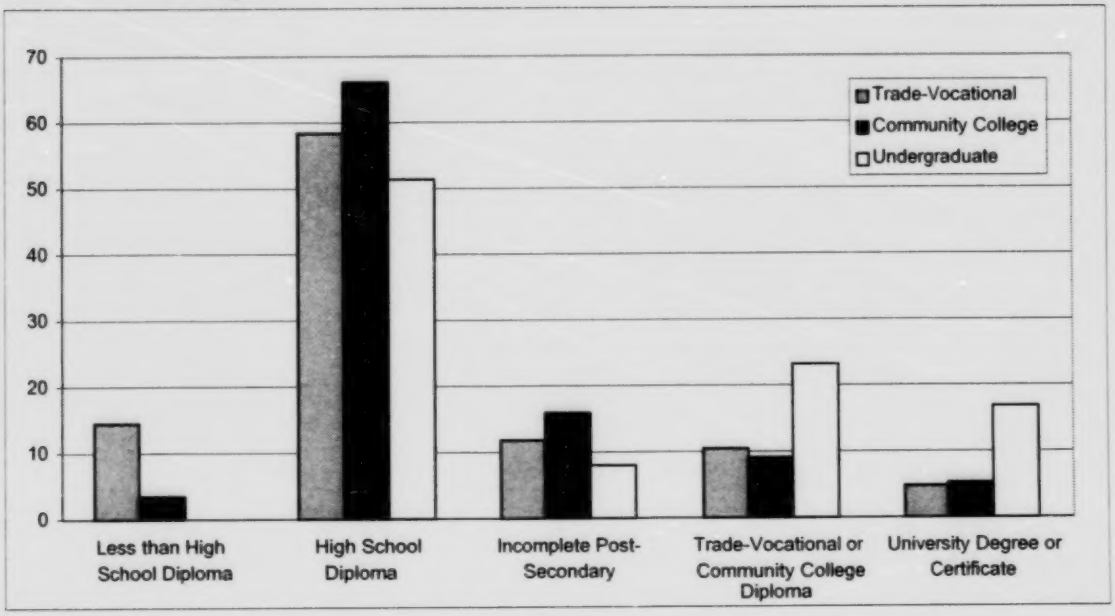
another 10% had unemployment as their major activity; and 10% had keeping house as their major activity. Slightly less than 25% of trade-vocational graduates had school as their major activity before enrolment.

Figure 3.3 **Distribution of Graduates by Major Activity during the 12 Months before Enrolment**

In contrast, over 55% of community college graduates and over 70% of BA graduates had school as their major activity in the twelve months before enrolment. Somewhat more than 35% of community college graduates and somewhat less than 25% of university graduates had work as their major activity before enrolment. To sum up, trade-vocational graduates were for the most part in the labour force before enrolment; BA graduates and, to a lesser extent, community college graduates were chiefly students before enrolment.

Figure 3.4 gives the highest level of study completed by graduates at each level before enrolling in their program. A high school diploma is the predominant level of previous education for graduates at each of the three levels. The trade-vocational level is distinguished from the community college and BA levels by having a significant proportion of graduates who had not completed high school prior to enrolment. As noted in the preceding chapter, trade-vocational education, as defined in the NGS, includes programs which do not normally require high school graduation.

Figure 3.4 **Distribution of Graduates by Highest Level of Studies before Enrolling in Program**



It also seems worth remarking that 25% of trade-vocational graduates have either undertaken or completed some previous course of study at the post-secondary level (including the trade-vocational level). The same is true of 30% of community college graduates and over 45% of BA graduates.[20]

Characteristics of Programs

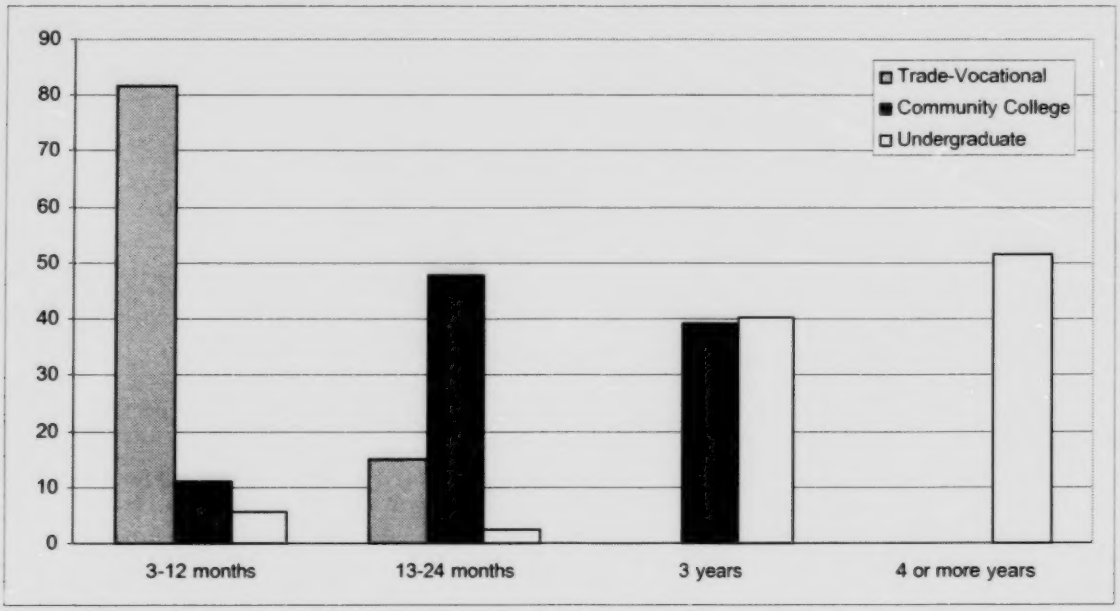
The fields of study and curricula of programs at the trade-vocational level are not easily compared with those of programs at the community college and university undergraduate levels. In this section we limit ourselves to a comparison of three aspects of programs at these levels—their duration, whether studies were full-time or part-time and the gender-specificity of graduates' fields of study.

Figure 3.5 gives the distribution of normal full-time program duration for each of these three levels of study. In principle, trade-vocational programs have a duration of three to twelve

[20] The high percentage of BA graduates who already had a university degree,diploma or certificate reflects in part the presence of first professional degrees (which may follow a BA) and of BAs awarded to persons who completed one or more undergraduate diplomas or certificates in the course of their studies.

months. In fact, we see that while 82% of trade-vocational graduates took courses which fall into this range, another 15% took courses whose normal length is more than a year.

Figure 3.5 **Distribution of Graduates by Duration of Program**



The largest group of community college graduates took courses whose normal length is 13-24 months. The next largest group is those whose course of study normally lasts three years. Combining these groups, slightly under 90% of community college graduates took courses whose normal length is between one and three years. The remaining 10% of community college graduates took courses that normally last less than a year.

One of the principal criteria for distinguishing trade-vocational programs from community college programs is course length. The distinction between the trade-vocational and community college levels is therefore somewhat blurred by the presence of trade-vocational courses whose normal length is more than a year and of community college courses whose normal length is less than a year.

Over 90% of university graduates took programs whose normal duration is 3 years or more. The remaining 10% with program durations of 2 years or less are probably for the most part graduates receiving a first professional degree and graduates who combined certificates or major and minor programs to obtain their BA.

Among graduates at the trade-vocational level, 92% studied full-time only, while among graduates at the community college level, 90% studied full-time only. In contrast, only 77% of BA graduates studied full-time only. At the community college and BA levels, most graduates who did not study full-time only combined full-time and part-time studies. At the trade-vocational level, most graduates who did not study full-time only studied part-time only. This may well be because the shorter length of trade-vocational programs offers little scope for combining full-time and part-time studies.

We noted above that while women are a majority of graduates at all three levels, it is in trade-vocational programs that men make up the highest proportion of graduates. The gender-specificity of programs differs more between the different levels than does the proportion of women in the overall number of graduates, and is highest for trade-vocational programs.

We adapt as a criterion that a field of study is gender-specific if 80% or more of the graduates in the field are either men or women.[21] On the basis of this criterion, 54% of male trade-vocational graduates were in male-specific programs and 71% of female trade-vocational graduates were in female-specific programs. The six fields of study which graduated the most men at the trade-vocational level were all male-specific; and the six fields of study which graduated the most women were all female-specific.[22]

At the community college level, there was a considerably lower degree of concentration of male graduates in male-specific programs and of female graduates in female-specific programs than at the trade-vocational level. In 1990, 27% of male community college graduates studied in programs where 80% or more of graduates were men; and 48% of female community college

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[21] The field of study structure used here is the structure developed for the Canadian Occupational Projections System (COPS) Student Flow Model. (Employment and Immigration Canada, 1987, Appendices) This structure aggregates the USIS/CCSIS codes for fields of study used in the NGS into forty-nine fields of study at the trade-vocational level, fifty-five fields of study at the community college level and fifty-eight fields of study at the university level. In each case, one of these is a residual field (unknown for trade-vocational and community college and no specialization for university).

[22] The six trade-vocational fields of study graduating the most men in 1990 were electrical and electronic technologies, auto mechanics, heavy equipment mechanics, other mechanical engineering technologies, construction technologies and other architecture and construction technologies. Those graduating the most women were social services technologies, other social science technologies, business and commerce technologies, general secretarial, other secretarial and nursing aide/orderly.

graduates studied in programs where 80% or more of graduates were women.[23] At the university BA level, only 16% of male BA graduates and 10% of female BA graduates graduated from gender-specific programs.[24]

Further Studies

By the 1992 survey, 12% of trade-vocational graduates, 10% of community college graduates and 16% of university graduates had completed other university, college or trade-vocational degree, diploma or certificate programs. By the 1995 survey, these graduates, and those who between June 1992 and the 1995 survey completed any education or training that has led to a degree, diploma, certificate or licence constituted 30% of 1990 trade-vocational graduates, 27% of 1990 community college graduates and 38% of 1990 BA graduates.[25]

Much smaller proportions of graduates had levels of schooling in 1995 which were higher than their level at program completion in 1990. Among 1990 trade-vocational graduates, 13% had a higher level of completed schooling in 1995 than at graduation in 1990. Among community college graduates, 9% had a higher level of completed schooling in 1995 than at graduation. Among BA graduates, 12% had a higher level of completed schooling in 1995 than at graduation.[26]

Only those graduates who said they had completed additional schooling by 1995 could have a level of schooling in 1995 that was higher than their level at graduation in 1990.[27] Among trade-vocational graduates who said they had completed additional schooling, 53% of those whose highest level of schooling in 1990 was a trade-vocational qualification still had a trade-vocational

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[23] 17% of female community college graduates were in nursing diploma and other nursing programs, each of which had over 85% women among its graduates.

[24] Male graduates in male-specific BA programs are almost entirely accounted for by engineering and computer science graduates. Nursing (4.4% of female BAs) is by far the largest source of female graduates in female-specific programs.

[25] Note that the language of the 1995 question is far less explicit as to the type of program than is the language of the 1992 question.

[26] At each level, a small proportion of graduates had a higher level of schooling when they graduated than the level at which they graduated, presumably because they graduated at a lower level than their highest level of schooling before enrolment. These groups are much too small to allow comparison of their levels of schooling in 1990 and 1995.

[27] This is a necessary consequence of the way in which the 1995 highest completed level of schooling variable was derived, since information on the highest levels of schooling in 1992 and in 1995 was derived from the graduation level and the highest level before enrolment for all other respondents.

qualification as their highest level of schooling in 1995 and 38% had a community college diploma as their highest level of schooling.

At the community college level, 66% of those who said they had completed further education and whose highest level of schooling in 1990 was a community college diploma still had a community college diploma as their highest level of schooling in 1995, while 10% had an undergraduate diploma or certificate and 23% had a BA. At the BA level, 67% of those who said they had completed additional schooling and whose highest level of schooling in 1990 was a BA were still at this level in 1995, 8% had received an graduate diploma or certificate, and 24% had received a MA.

In summary, at each level less than half of 1990 graduates who reported completing more schooling by 1995 had increased their highest level of schooling from 1990 to 1995. Presumably those whose highest level of schooling did not increase completed courses at the same or lower level. Those graduates whose highest level of schooling advanced from 1990 to 1995 typically rose by one level. Thus trade-vocational graduates obtained a community college diploma, community college graduates obtained an undergraduate diploma, certificate or degree and BA graduates obtained a graduate diploma or certificate or a MA.

Apprenticeship is another possible source of additional training after graduation, and graduates of pre-apprenticeship courses are explicitly included in the universe of the trade-vocational file. In 1992, 10% of trade-vocational graduates were registered apprentices, as were 3% of community college graduates. Community college graduates made up 22% of all 1990 graduates who were registered apprentices in 1992. This points up again that the distinction between community college courses and trade-vocational courses is not always easily made.

Labour Market Outcomes

In this section, we compare the labour market outcomes for 1990 graduates at the three levels. Figure 3.6 gives unemployment rates at the 1992 and 1995 interviews for graduates. The unemployment rate for trade-vocational graduates is about double the rate for community college and BA graduates in both 1992 and 1995. Unemployment rates fell sharply for all three groups between the two surveys, partly as a result of improving labour market conditions and partly as a result of accumulated labour market experience.

Figure 3.6 **Unemployment Rate of Graduates in 1992 and 1995**

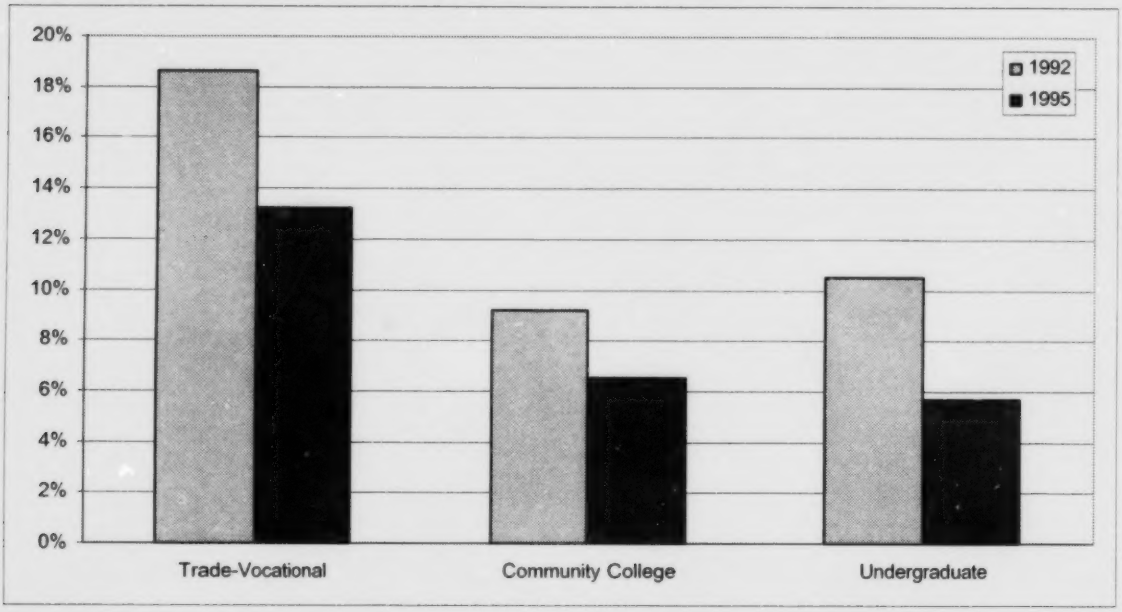
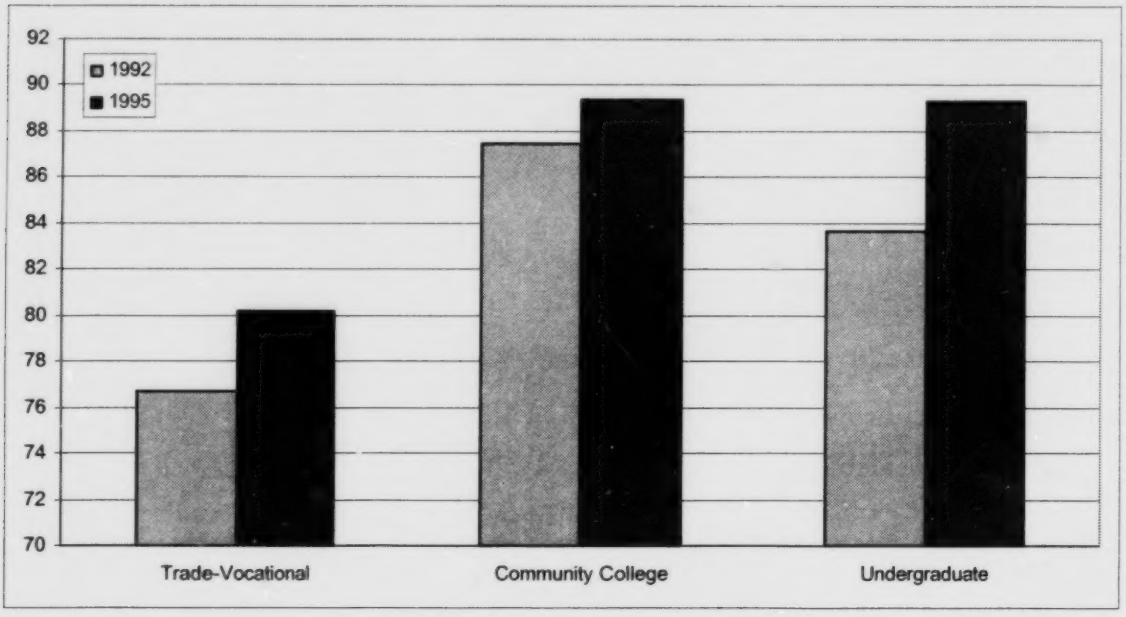


Figure 3.7 gives the employment rate (employment-population ratio) for the three levels in 1992 and in 1995. As one would expect, employment rates are much higher for community college and BA graduates than for trade-vocational graduates. Employment rates rose from 1992 to 1995, corresponding to the fall in unemployment rates.

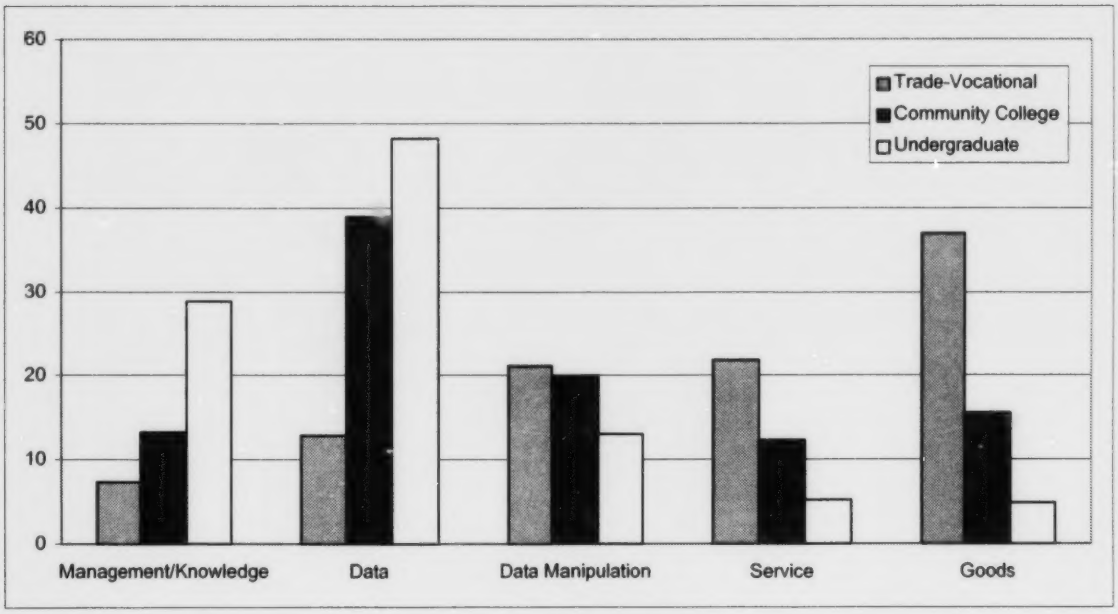
Figure 3.7 **Employment Rate of Graduates in 1992 and 1995**



Among those graduates who were employed in 1992, 74% of trade-vocational graduates, 80% of community college graduates and 77% of BA graduates said they used the skills acquired in their program to a great extent or to some extent at their job. Among those employed in 1995, 71% of trade-vocational graduates, 78% of community college graduates and 78% of BA graduates reported using to a great extent or to some extent at their job. Thus trade-vocational graduates have a slightly lower rates of skill use and slightly more deterioration in skill use between the two surveys.

Figure 3.8 gives the occupational category of graduates' jobs in 1992, using a system of occupational categories based on the information content of occupations.[28] Management occupations, knowledge occupations and data occupations constitute the skilled information sector of the workforce. Knowledge occupations involve mainly the generation of ideas or the provision of expert opinions. (Lavoie and Roy, 1998, p.11) Data occupations are information occupations which require the application of a high degree of knowledge, but are not primarily involved in creating knowledge or in supplying expert opinion. Data manipulation occupations

Figure 3.8 **Occupational Category of Employed Graduates' 1992 Job**



[28] The distributions for 1995 are very similar and therefore are not reported here.

involve the routine manipulation of symbolic information. The skilled information occupations, together with the more routine data manipulation occupations, make up the information sector of the workforce.

Service occupations involve providing direct services; goods occupations involve the production of goods. Goods occupations are divided into skilled goods occupations, which require the application of a high degree of knowledge or acquired skills, and other goods occupations. (See Boothby, forthcoming, for a more complete description of how occupations were classified in this system.)

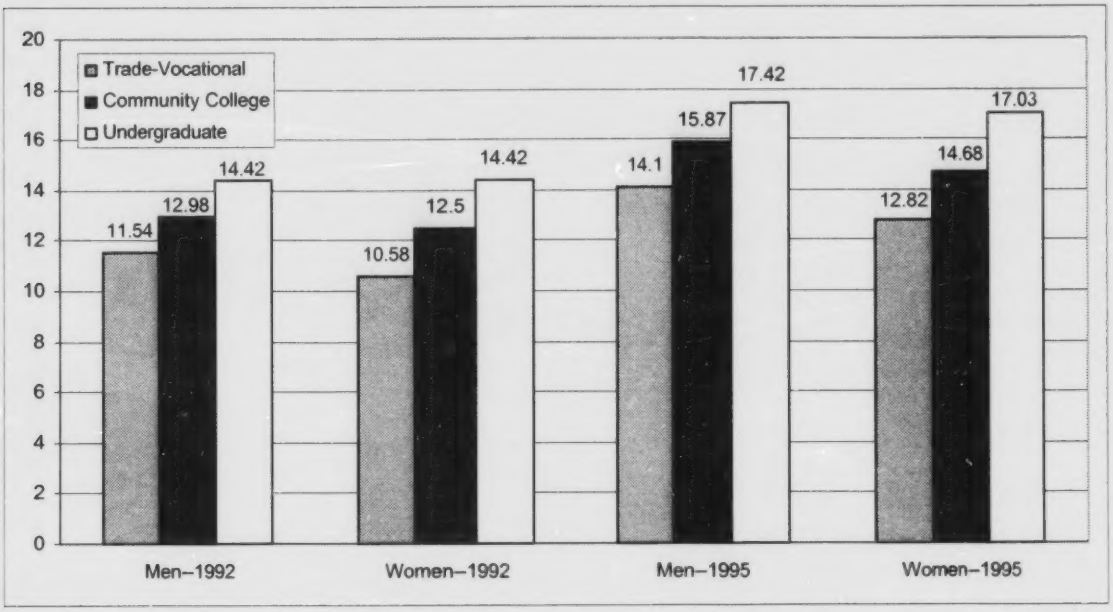
There are striking differences in the occupational categories of trade-vocational graduates' jobs and the categories of community college and BA graduates' jobs. Over 50% of community college graduates and almost 80% of BA graduates worked in skilled information occupations, compared to around 20% of trade-vocational graduates. More than 35% of trade-vocational graduates worked in goods occupations, while over 20% worked in service occupations. In both cases, this is much higher than the percentage of community college or university graduates in the occupational category. Data manipulation occupations are the only category with comparable percentages of community college and trade-vocational graduates (about 20%).

As one would expect from these differences in the occupational distributions of graduates at various levels, trade-vocational graduates earn less than other post-secondary graduates. Figure 3.9 gives the median hourly wage of employed male and female graduates at the trade-vocational, community college and BA levels in 1992 and in 1995.[29]

The figure shows that BA graduates earn more than community college graduates who earn more than trade-vocational graduates do. From 1992 to 1995, earnings increased 20% or more for men at all three levels. Earnings growth was slower for women than for men at all three levels, so that earnings disparities between women and men widened. Earnings differences between women and men are largest for trade-vocational graduates and smallest for university graduates.

[29] The hourly wage was estimated by dividing the respondent's estimate of full-year earnings by usual hours x 52. Since this involves three sources of error (in earnings, in hours and in weeks worked), large outliers are likely. For this reason, we report medians rather than means, which tend to be more influenced by outliers.

Figure 3.9 **Median Hourly Wage of Employed Graduates in 1992 and 1995**



Summary

How do trade-vocational graduates differ from community college graduates and BA graduates? First, in their age and in their region of residence, educational level and major activity before undertaking their programs. Trade-vocational graduates are drawn from a wider range of ages than are community college and university graduates. They are much likelier to reside in the Atlantic provinces (excluding Quebec) or in British Columbia before their program than are community college and BA graduates. Persons who have not completed high school are a significant proportion of trade-vocational graduates, and an insignificant proportion of graduates at other levels. The major activity of most trade-vocational graduates prior to beginning their course was employment or unemployment; the major activity before studies of most community college and BA graduates was attending school.

Next, in the characteristics of the courses they take. Trade-vocational courses of study are much shorter than community college and BA courses of study. Male trade-vocational graduates tend to have studied in male-dominated fields of study and female trade-vocational graduates in female-dominated fields of study to a far greater extent than male and female community college and BA graduates.

Finally, trade-vocational graduates differ from community college and university graduates in their activities after schooling. A significant proportion of trade-vocational graduates enter apprenticeships, while a much smaller proportion of community college graduates become apprentices. Roughly comparable proportions of trade-vocational, community college graduates and BA graduates obtain additional schooling. The levels attained by those who obtain additional schooling differ, however. Trade-vocational graduates obtain community college diplomas, while community college graduates obtain university undergraduate qualifications.

Examination of graduates' labour market activities after schooling also shows significant differences between the different levels. Trade-vocational graduates are much more likely to be unemployed and much less likely to be employed than are community college and BA graduates. This is true for both the survey two years after graduation and the survey five years after graduation.

Most community college graduates and BA graduates find work in skilled information occupations. While a significant minority of trade-vocational graduates find work in these occupations, the largest group of trade-vocational graduates work in goods producing occupations. As one would expect from these differences in occupational distribution, employed trade-vocational graduates earn less than both community college graduates and BA graduates.

Based on these comparisons, there would appear to be some difficulty in drawing the line between trade-vocational programs and community college programs. Some community college programs last less than a year, while some trade-vocational programs last more than a year. Community college graduates are a significant proportion of graduates who become apprentices.

In general, however, community college graduates would appear to be far more similar to university graduates than to trade-vocational graduates in their characteristics and activities before, during and after their course of studies. Rather than pursuing our comparisons between graduates at different levels any further, we turn now to comparisons among trade-vocational graduates in different fields of study.

4. Comparison of Aggregated Fields of Study

Chapter 3 compared the trade-vocational level of studies to the community college and BA levels. This chapter examines the characteristics of trade-vocational graduates and their programs at the level of aggregated fields of studies. As mentioned previously, we use the COPS fields of study structure in this study. In the COPS structure, the forty-eight fields of study at the trade-vocational level are grouped into six aggregated fields of study: arts, business, health, engineering techniques, primary industries and services and social services. Table 4.1 presents the structure of this aggregation.

Table 4.1 **COPS Aggregated Fields of Study**

Aggregated FOS	*COPS FOS*
Arts	General Arts and Sciences Commercial and Promotional Arts Creative and Design Arts Graphic and Visual Arts Personal Arts Other Arts
Business	Management and Administration—Business and Commerce Accounting Retail Sales Other Management and Administration Secretary—General Secretary—Legal Secretary—Medical Secretary—Word Processing Secretary—Accounting and Bookkeeping Other Secretarial and Clerical Computer Science
Health	Nursing Aide/Orderly Other Nursing Dental Hygiene Assistant/Technician Other Health
Engineering Techniques	Electrical/Electronic Engineering Technician Other Electrical/Electronic Engineering Transportation Technician Agricultural Equipment Mechanic Auto Mechanic Auto Body Mechanic Heavy Equipment Mechanic Other Mechanical Engineering Architectural Design/Drafting Technician Construction Technician Welding Technician Other Architectural and Construction Technician

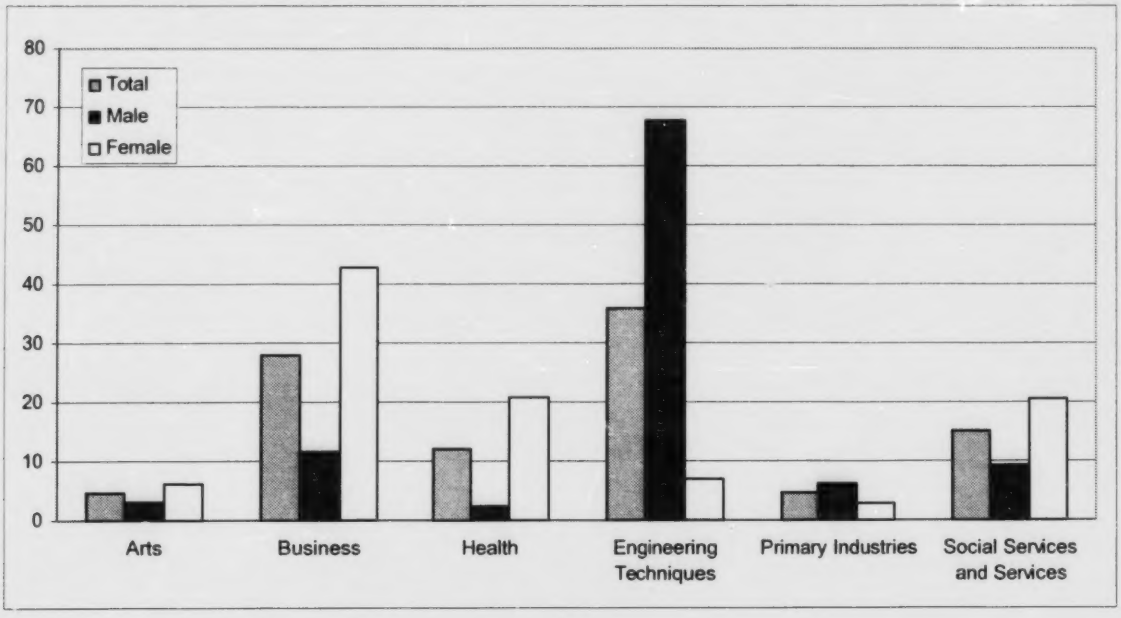
Table 4.1 **(continued)**

	Manufacturing Technician Machinist Other Industrial Engineering Civil Technologies Drafting Other Engineering
Primary Industries	Agriculture Food Processing Technician Other Primary Industry Technicians
Social Services and Services	Social Services Other Social Sciences Cooking Other Food Preparation Other Service Industry Technician

Gender, Age, Visible Minority Status and Regional Distribution before Enrolment

Figure 4.1 gives the distribution of 1990 trade-vocational graduates by aggregated field of study and by gender. The figure shows that the arts and primary industries aggregated fields of study each account for slightly under 5% of graduates. The largest aggregated field of study is engineering techniques with over 35% of graduates, followed by the business group, with 28% of graduates. The services and social services group accounts for 15% of graduates, while the health group has 12% of graduates.

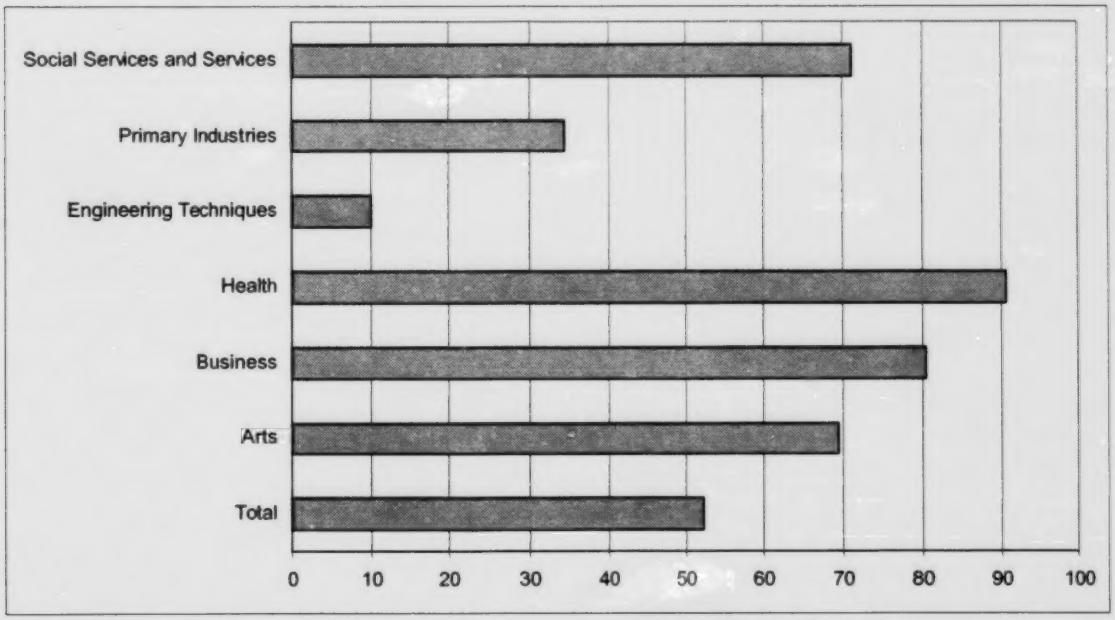
Figure 4.1 **Distribution of Aggregated Field of Study of Trade-Vocational Graduates by Gender**



The distributions of male and female trade-vocational graduates by aggregated field of study differ quite dramatically. Over 40% of female graduates are in the business group, while the social services and services and health groups each account for about 20% of female graduates. Almost 70% of male graduates are in the engineering techniques aggregated field of study, while the business and social services and services groups each account for about 10% of male graduates.

These differing distributions by aggregate field of study reflect the high degree of gender specificity of trade-vocational fields of study we noted in the Chapter 3. Figure 4.2 gives women as a percentage of graduates by aggregated field of study. The figure shows that women are over 90% of trade-vocational graduates in the health group, over 80% in the business group, and around 70% in the social services and services and the arts groups. Women are only 35% of graduates in the primary industries group, and are only 10% of graduates in the largest group, engineering techniques.

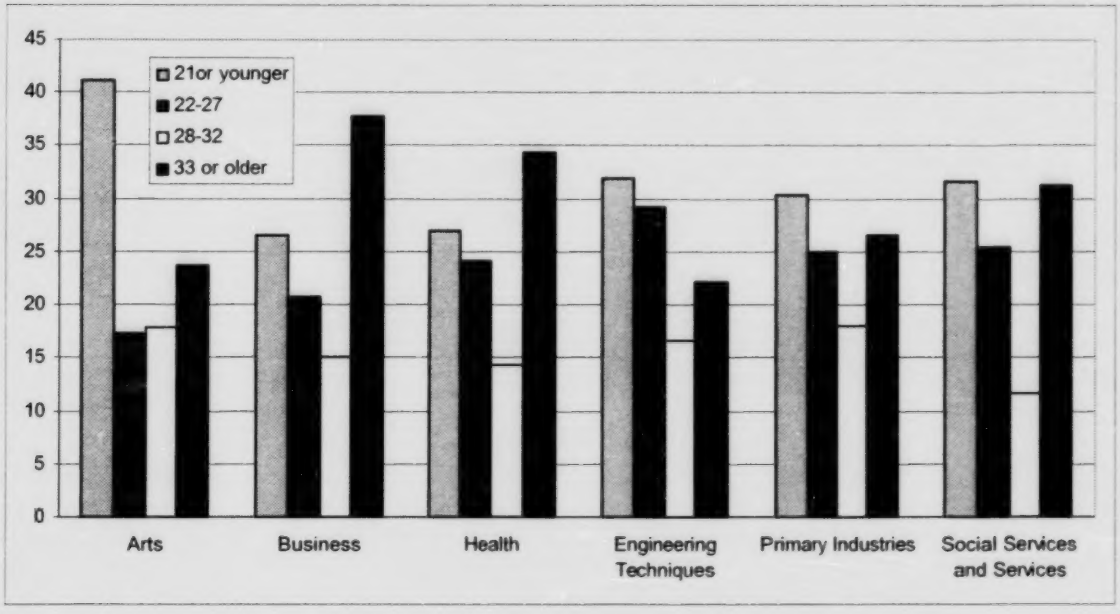
Figure 4.2 **Women as a Percentage of Trade-Vocational Graduates by Aggregated Field of Study**



The aggregated fields of study also differ in the age distribution of their graduates, as shown in Figure 4.3. In the female-dominated business, health and social services and services groups, the largest age group of graduates was 33 years old or older around the time of their graduation. In

the male-dominated engineering techniques and primary industries groups, the largest age group was 21 years old or younger. This was also the case for the health group.

Figure 4.3 **Age of Trade-Vocational Graduates in June 1990 by Aggregated Field of Study**



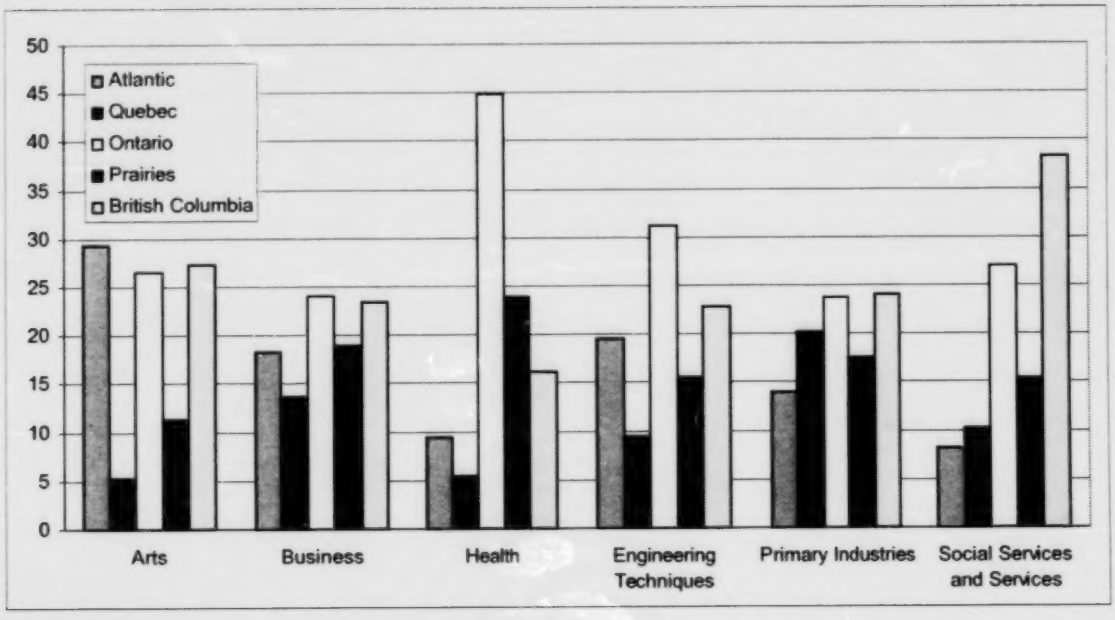
Despite the presence of a large group of older graduates, most trade-vocational graduates are young. A majority of graduates were less than 28 years old when they completed their studies in every aggregated field of study except business, where 48% of all graduates were less than 28 years old when they finished their program.

Another important demographic characteristic of graduates is their visible minority status. As we saw in Chapter 3, trade-vocational graduates are more likely to be members of visible minorities than are community college and BA graduates. Overall, around 14% of 1990 trade-vocational graduates were members of visible minorities. The proportion of members of visible minorities was close to 14% in each aggregated field of study, with two exceptions. In the primary industries group, 92% of graduates were not members of visible minorities; in the social services and services group, 17% of graduates were members of visible minorities.

In Chapter 3, we showed that 1990 trade-vocational graduates are much more likely than community college or BA graduates to have been residents of the Atlantic provinces or of British

Columbia before enrolment. Figure 4.4 shows there are important differences among trade-vocational aggregated fields of study in the region of residence of their graduates prior to enrolment. The most striking instances are a much heavier concentration of health graduates among Ontario residents than for other aggregated fields of study and a much heavier concentration of social services and services graduates in British Columbia than is the case for other aggregated fields of study.

Figure 4.4 **Region of Residence of Trade-Vocational Graduates before Enrolment by Aggregated Field of Study**

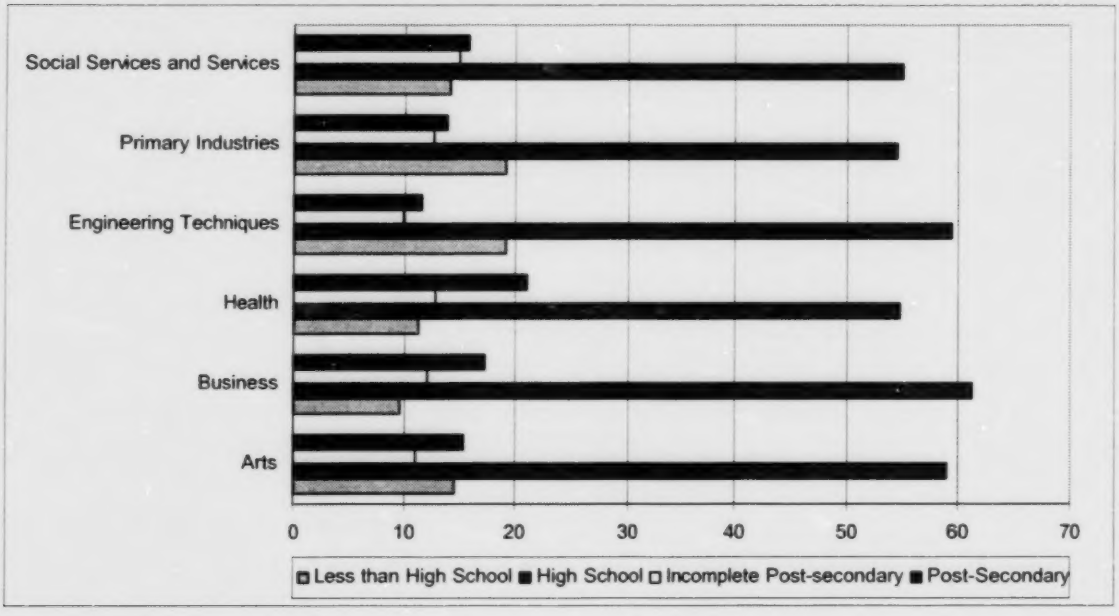


Caution should be used in interpreting these regional differences. As discussed in Chapter 2, trade-vocational education is part of a series of provincial educational systems which vary widely in their institutional arrangements. For example, it might be the case that Ontario is over-represented in health trade-vocational courses because courses which lead to health occupations are trade-vocational courses in Ontario and community college courses elsewhere. A detailed exploration of these regional differences is beyond the scope of this study, but we cannot over-empasize their importance in interpreting regional variation in data concerning the trade-vocational system.

Educational Level and Major Activity before Enrolment

We noted previously that the educational level before enrolment of trade-vocational graduates differs from that of community college and university graduates. The most marked difference is the significant proportion of trade-vocational graduates who had not completed high school before beginning their program. Figure 4.5 gives the educational level of trade-vocational graduates before enrolment by aggregated field of study.

Figure 4.5 **Educational Level of Trade-Vocational Graduates before Program by Aggregated Field of Study**



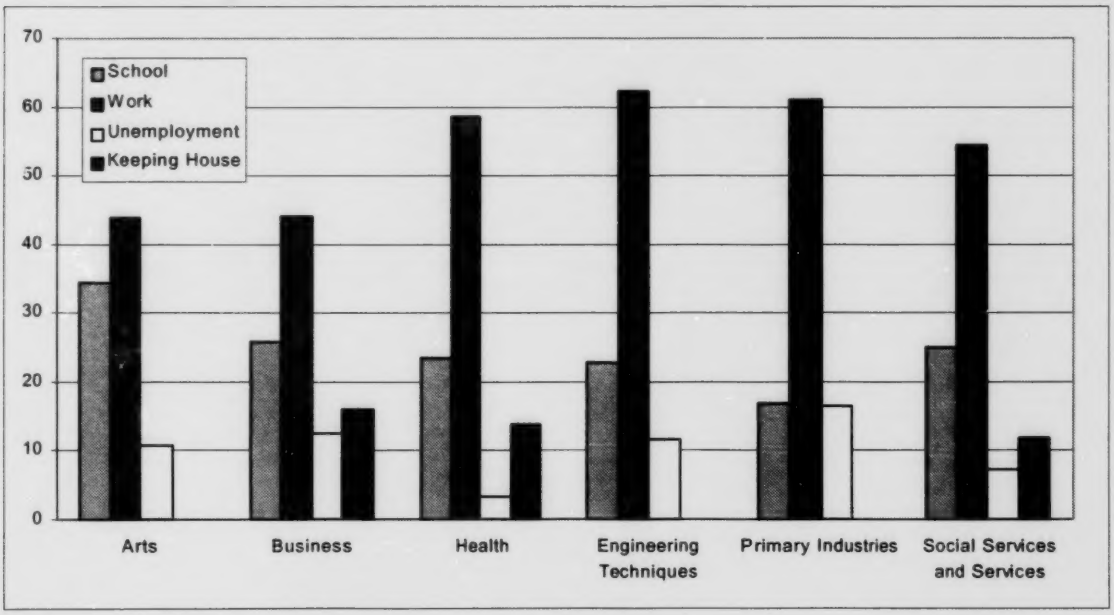
The figure shows that there are considerable differences among aggregated trade-vocational fields of study in the educational attainment of graduates before enrolment, although these differences are smaller than those between trade-vocational graduates on the one hand, and community college and BA graduates on the other. The proportion of trade-vocational graduates who had not completed high school before enrolling is highest in the male-dominated engineering techniques and primary industries groups (around 18%) and lowest in the business group (less than 10%). The proportion of graduates with a post-secondary degree, diploma or certificate before enrolment was highest in the health group (over 20%) and lowest in the engineering techniques group (12 %).

Despite these differences, in every trade-vocational aggregated field of study most graduates were high school graduates before enrolment. All aggregated fields of study have a significant proportion of graduates who had not completed high school before enrolment, and all have significant proportions of graduates who had incomplete post-secondary studies before enrolment or who had a post-secondary degree, diploma or certificate before enrolment.

Trade-vocational graduates also differed from community college and BA graduates in their major activity in the twelve months before enrolment. Trade-vocational graduates were far more likely to have employment or unemployment as their major activity, and far less likely to have going to school as their major activity.

Figure 4.6 shows the major activity of graduates before enrolment by aggregated field of study. In every field of study group, working is the most common activity before enrolment, followed by going to school. The relative importance of these activities varies among the groups. In the engineering techniques and primary industries group, over 60% of graduates were working prior to enrolment. This percentage falls to slightly under 60% in the health group, to 55% in the social services and services group, and to around 45% in the business and arts groups.

Figure 4.6 **Major Activity of Trade-Vocational Graduates before Enrolment by Aggregated Field of Study**

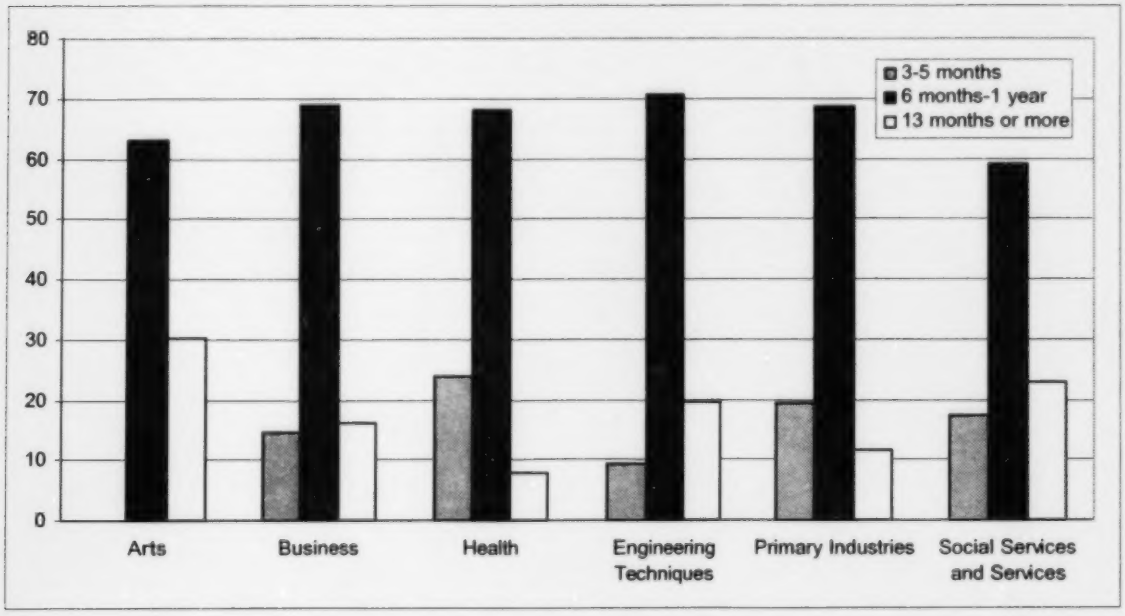


Arts is the aggregate field of studies with the highest proportion of graduates who were in school before enrolment; and this proportion is lowest in the primary industries group. The primary industries group has the highest proportion of graduates whose major activity before enrolment was unemployment. In the female-dominated aggregate fields of study (business, health, social services and services, arts) a significant proportion of graduates had keeping house as their major activity before enrolment.

Course Duration and Course Fees

Since by definition trade-vocational courses normally require a year or less of full-time studies, these courses were much shorter than most community college or BA courses of study. Figure 4.7 examines differences in course duration by aggregated trade-vocational field of study. In every field of study group, most courses require between six months and a year of full-time study. The percentage of graduates whose courses required six months to a year of studies ranges from slightly under 60% in the social services and services group to slightly over 70% in the engineering techniques group.

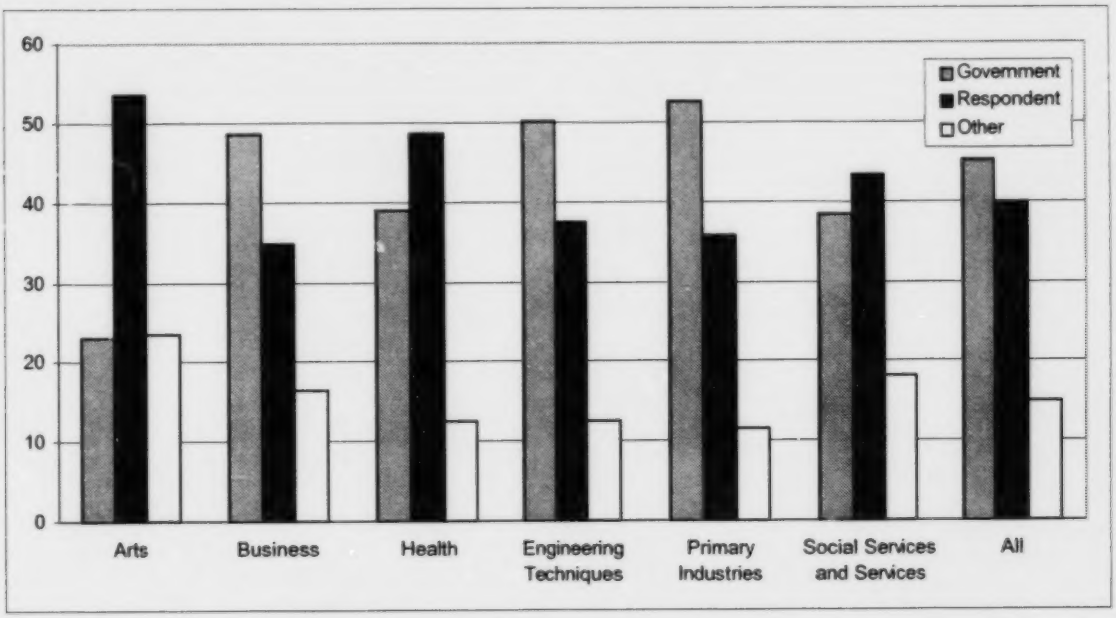
Figure 4.7 Program Duration for Trade-Vocational Graduates by Aggregated Field of Study



Almost 30% of graduates in the arts group completed courses requiring more than a year of study. This percentage drops to around 20% for the social services and services group and engineering techniques group, and is less than 10% for the health group. Courses of less than six months are most frequent among health graduates (over 20%) and least frequent among engineering techniques graduates (less than 10%).

As discussed in the first chapter, some trade-vocational graduates were included in the trade-vocational sample because they had participated in a training program. In this case, the federal government or a provincial government may have paid their course fees. Figure 4.8 gives the distribution of who paid for course fees by aggregate field of study.[30]

Figure 4.8 **Distribution of Who Paid Course Fees of Trade-Vocational Graduates by Aggregated Field of Study**



[30] The questionnaire item on which this figure is based was asked only of trade-vocational graduates and allowed multiple responses. The government paid category in Figure 4.8 is based on respondents who said that either CEIC or a provincial government had paid for their course fees, regardless of what other replies may also have been given. The respondent paid category is based on respondents who did not give the CEIC or a provincial government as a response, and did say that they had paid, regardless of any other replies. The other paid category consists of the respondents who are in neither the government paid or the respondent paid category.

The figure shows that federal or provincial governments paid at least part of the course fees for 45% of trade-vocational graduates (government paid), that graduates paid at least part of the fee (and governments none of the fee) for 40% of trade-vocational graduates (graduate paid), and that for the remaining 15% of graduates someone other than government or the graduate paid all of the course fees (other paid).

There is considerable variation among the aggregated fields of study in who paid for the course of studies. In the primary industries and engineeering techniques groups, governments paid for more than 50% of all completed courses. In the business group, governments paid for almost 50% of completed courses. In the arts, health and social services and services groups, graduates were more likely to have paid their course fees without government assistance than to have received assistance with their fees. The proportion of graduates whose course fees were entirely paid by sources other than government and themselves was highest in the arts and social services and services groups, and lowest in the health, engineering techniques and primary industries groups.

Further Education and Apprenticeship

In Chapter 3, we noted that 30% of 1990 trade-vocational graduates had completed further education by 1995, somewhat higher than the 27% of community college graduates, but lower than the 38% of BA graduates who completed further education. Figure 4.9 gives the percentage of graduates in each trade-vocational aggregated field of study who completed a further program by 1995. Graduates in the health and engineering techniques groups were most likely to have completed further studies by 1995; graduates in the business and social services and services group were least likely to have completed further studies.

As noted in Chapter 3, not all of the graduates who completed a further program of studies increased their highest completed level of study over their level at graduation in 1990. For some graduates, the further program of studies was at the same level or a lower level as the highest completed level of studies at graduation. Figure 4.10 shows the percentage of those 1990 trade-vocational graduates who completed a further course by 1995 who raised their highest level of completed studies between graduation in 1990 and 1995.

Figure 4.9 **Percentage of Trade-Vocational Graduates Who Completed a Further Program by 1995 by Aggregated Field of Study**

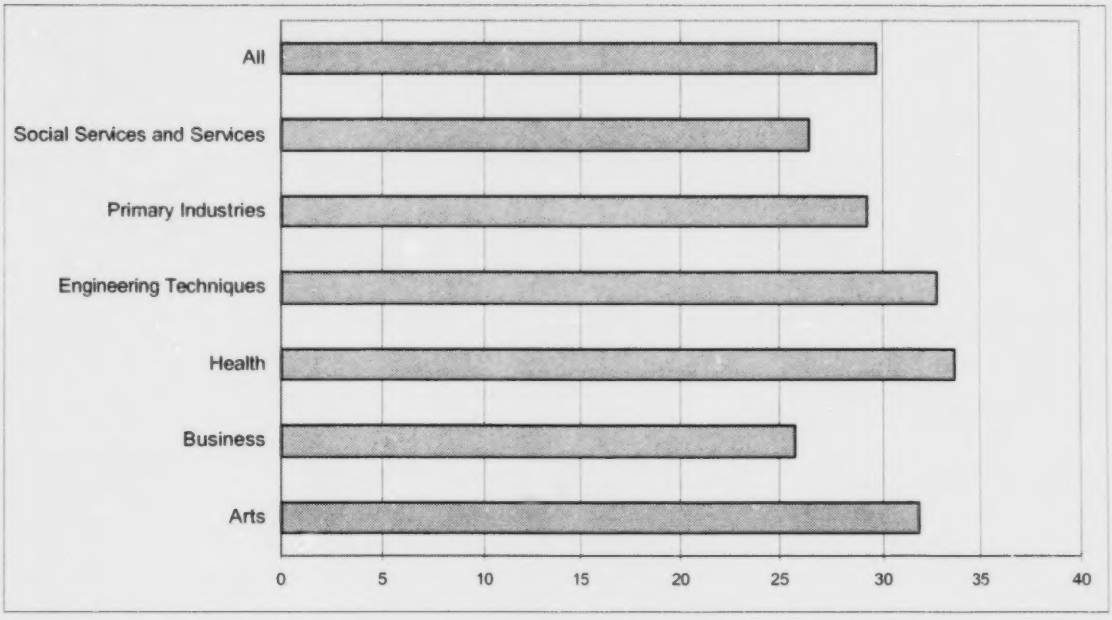
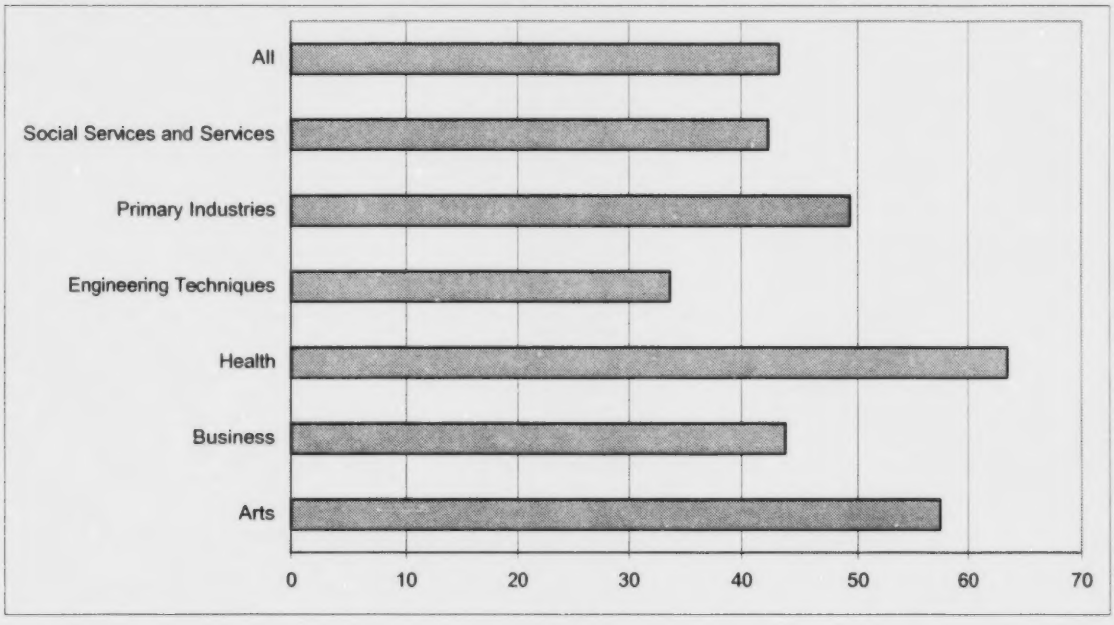


Figure 4.10 **Percentage of Trade-Vocational Graduates Completing a Further Program Whose Highest Completed Level of Study Increased by 1995**



Health graduates are not only the group of trade-vocational graduates most likely to have completed a further course of studies by 1995; they also have the highest percentage with an increased highest completed level of studies among those who completed a further course of

studies. Since 33% of 1990 trade-vocational health graduates completed a further program by 1995 and 62% of this 32% raised their highest level of completed studies, 20% of trade-vocational health graduates raised their highest level of completed studies between graduation in 1990 and 1995.

A striking difference between figures 4.9 and 4.10 concerns trade-vocational graduates in engineering techniques. This group of graduates has the second highest rate of completing further studies by 1995. Among those who complete further studies, graduates in engineering techniques have the lowest percentage who raise their highest level of completed studies by 1995.

We noted in Chapter 2 that pre-apprenticeship programs are explicitly included among trade-vocational programs for the purposes of the NGS. In Chapter 3, we saw that 10% of trade-vocational graduates are registered apprentices in 1992. Of these registered apprentices, 80% are in the engineering techniques aggregated field of study, with the remaining 20% fairly evenly distributed across the other aggregated fields of study, except health.

While 80% of registered apprentices are engineering techniques graduates, registered apprentices constitute only 23% of engineering techniques graduates. The only other group with a significant proportion of 1990 graduates who are registered apprentices in 1992 is social services and services, where 9% of graduates are registered apprentices.

Labour Market Outcomes—Unemployment and Employment

We turn now to a comparison of labour market outcomes for 1990 trade-vocational graduates by aggregated field of study. We begin by comparing the 1992 and 1995 unemployment and employment rates for the field of study groups. Figure 4.11 gives the unemployment rates, Figure 4.12 the employment rates (employment-population ratios).

The lowest unemployment rates by far in both 1992 and 1995 are among trade-vocational graduates in the health aggregated field of study; the next lowest in both years are for graduates in the social services and services groups. The highest unemployment rates in both 1992 and 1995 are among engineering techniques graduates, followed by business graduates and primary industry graduates.

Figure 4.11 **1992 and 1995 Unemployment Rates of Trade-Vocational Graduates by Aggregated Field of Study**

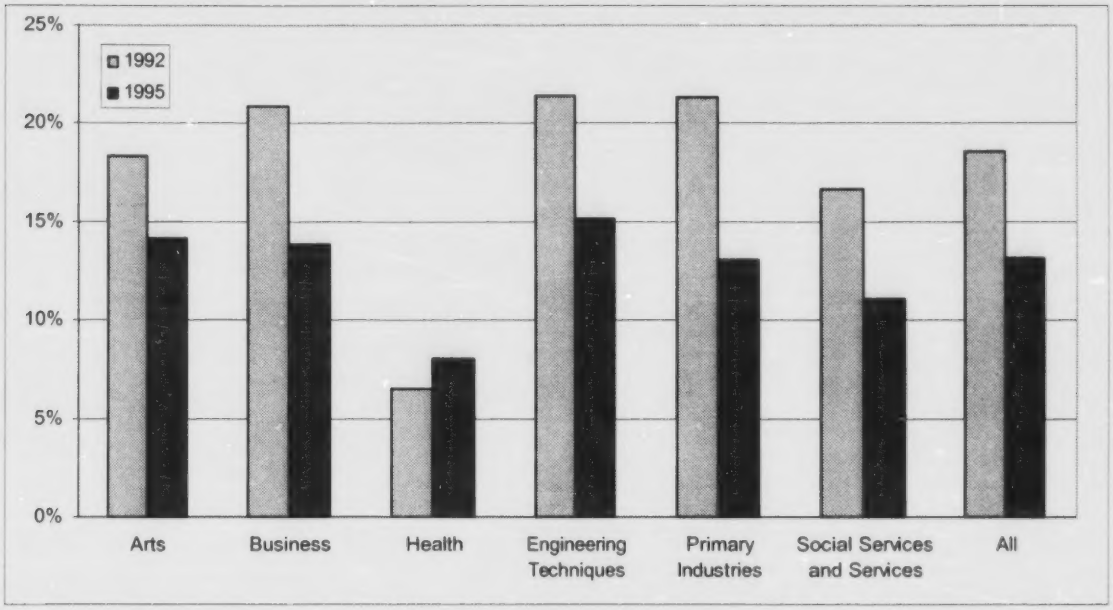
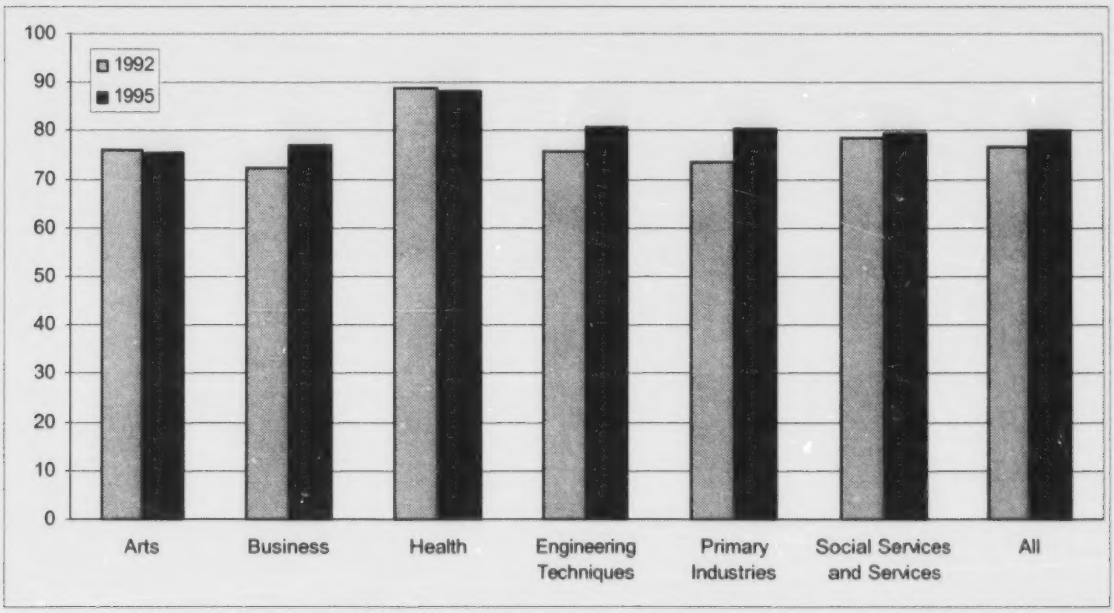


Figure 4.12 **1992 and 1995 Employment Rates of Trade-Vocational Graduates by Aggregated Field of Study**



Unemployment rates decreased sharply between 1992 and 1995 for graduates in all aggregated fields of study except health, where they increased somewhat. Some part of the overall decrease in unemployment rates for 1990 trade-vocational graduates is likely to be due to improving

overall economic conditions and some part to the accumulation of labour market experience over these three years.

Budget restrictions in the health sector may furnish a partial explanation for the increase in unemployment rates for trade-vocational health graduates. This group still has an unemployment rate five percentage points lower in 1995 than the overall rate for trade-vocational graduates. The gap in 1992 was eleven percentage points, however.

Health graduates also have higher employment rates in 1992 and in 1995 than trade-vocational graduates in other aggregated fields of study. Their employment rates in 1992 are ten percentage points higher than those of graduates any other aggregated field of study. By 1995, this gap had decreased to eight percentage points.

Employment rates increased significantly from 1992 to 1995 for graduates in the engineering techniques, primary industries and business groups. Once again, part of this improvement is likely to be due to improved overall economic conditions. Employment rates changed only slightly for graduates in the health, arts and social services and services groups.

Skill Use at Work, Occupational Category and Earnings

Figure 4.13 shows the percentage of 1990 trade-vocational graduates who used the skills learned in their course of study at their 1992 and 1995 jobs by aggregated field of study. Health graduates have by far the highest percentage who use their skills at their job—90% in 1992 and 85% in 1995. Engineering techniques and arts graduates have low levels of skill usage in both 1992 and 1995; primary industries graduates have relatively high levels of skill usage in 1992 and the lowest level of skill usage in 1995.

Skill usage decreased from 1992 to 1995 for every aggregated field of study group except engineering techniques, where it was essentially unchanged. With the exception of primary industries graduates, the decreases in skill usage are small. While the percentage of primary industries graduates who were employed increased over this period, there was a sharp decline in the percentage who were employed in jobs in which the skills they acquired in their course were relevant.

Figure 4.13 **Use at Work of Skills Learned in Course by Trade-Vocational Graduates by Aggregated Field of Study**

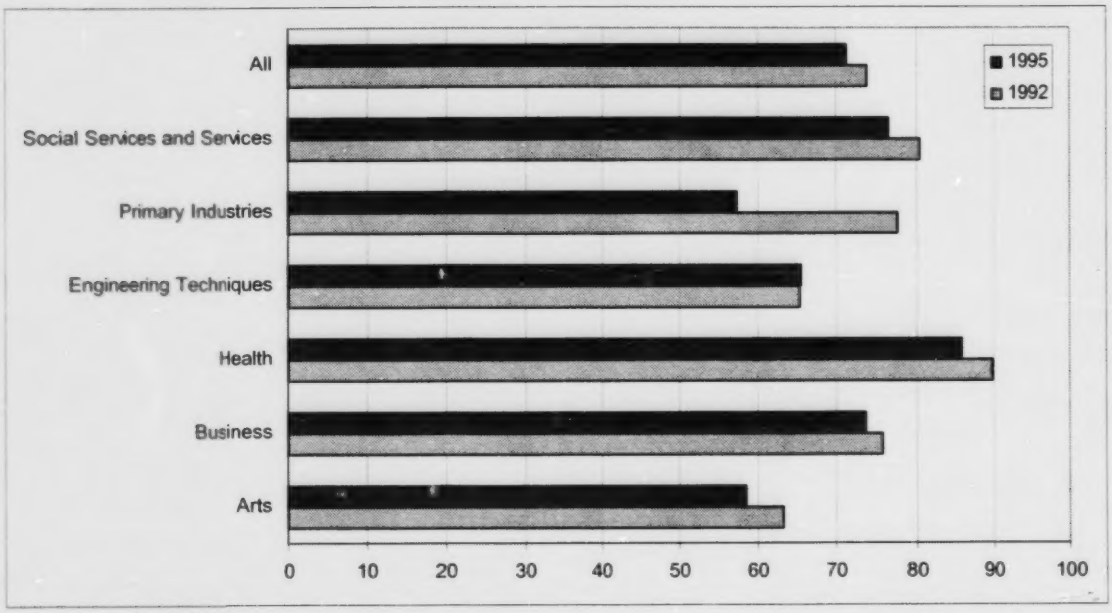
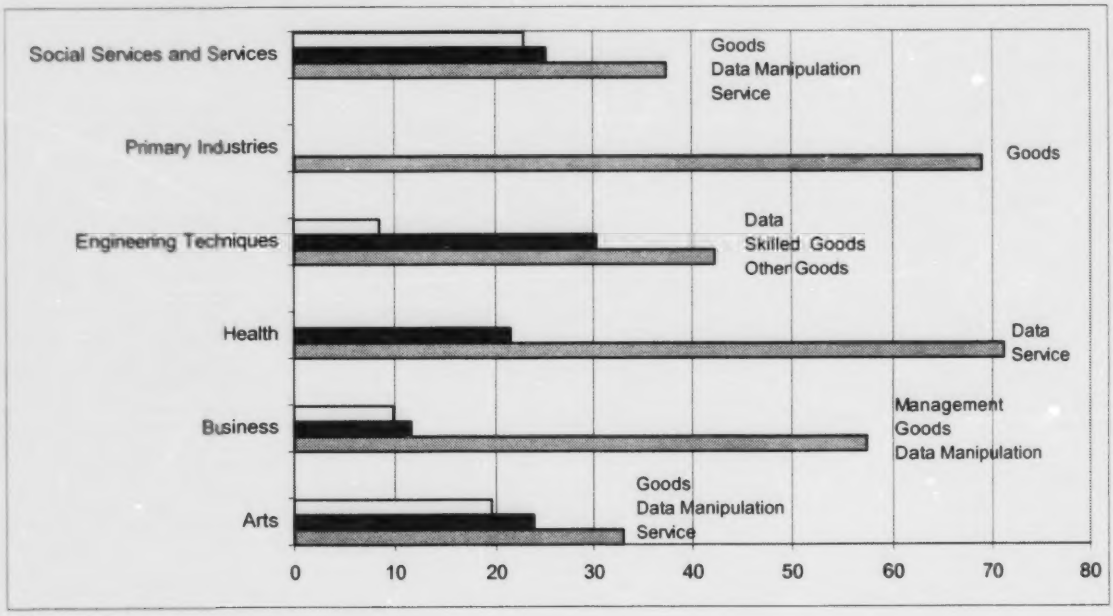


Figure 4.14 **1992 Occupational Distribution of Trade-Vocational Graduates by Aggregated Field of Study**



In Chapter 3, we showed that trade-vocational graduates have a very different occupational distribution from community college and BA graduates. Most community college and BA graduates work in skilled information occupations; most trade-vocational graduates work in data

manipulation, goods production and service occupations. In Figure 4.14, we examine the ocupational distribution in 1992 of employed 1990 trade-vocational graduates by aggregated field of study.[31] (Occupational distributions in 1995 were very similar.)

The only two aggregated fields of study with similar occupational distributions are arts and social services and services. In both of these fields of study, service occupations are the largest occupational categories, followed by data manipulation occupations and goods production occupations.[32]

Goods production workers predominate in two field of study categories—primary industries and engineering techniques. In both of these categories, goods production workers are around 70% of all employment. Among graduates in the primary industries group, we combined skilled goods and other goods workers into a single category, as there are too few skilled goods workers to report separately. In the engineering techniques group, 42% of employed graduates worked as other goods workers in 1992, 30% worked as skilled goods workers, and 8% were data workers.

The highest proportion of data workers was among graduates in the health aggregated field of study, where 20% of employed graduates worked in data occupations. Most of the remaining employed health graduates worked in service occupations, which employed over 70% of graduates in this aggregated field of study.

Aside from the presence of data workers among health graduates and engineering techniques graduates, the only significant instance of trade-vocational graduates working in skilled information occupations is the 10% of employed business graduates who worked as managers in 1992. By far the largest occupational category for business graduates was data manipulation, in which 57% of employed business graduates worked in 1992. Another 12% of employed business graduates worked in goods-producing occupations.

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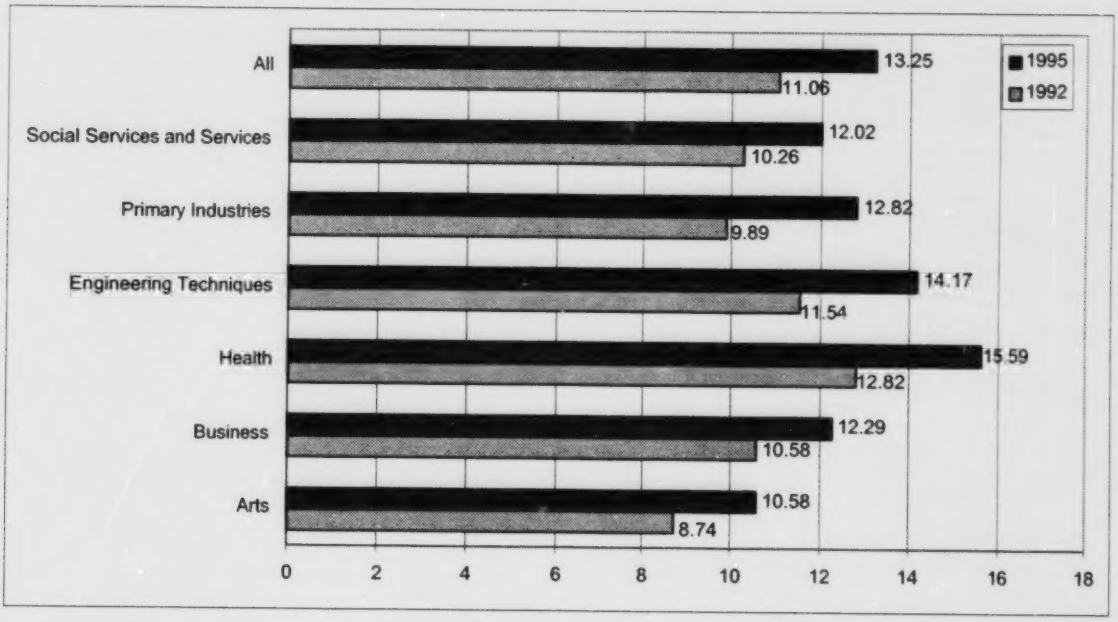
[31] The overall occupational distribution for 1990 trade-vocational graduates in 1992 is shown in figure 3.8 in Chapter 3.

[32] Goods production occupations includes both skilled goods occupations and other goods occupations. The only field of study group with a significant number of skilled goods workers is the engineering techniques group; for this group we distinguish between skilled goods workers and other goods workers.

Trade-vocational graduates' hourly wages also varied with their field of study, as shown in Figure 4.15. Employed graduates in the social services and services, primary industries and business fields of study had roughly comparable hourly wages in 1992 and again in 1995. In both 1992 and 1995, there is a step up of roughly one dollar from the high end of hourly wages in these three aggregated fields of study to hourly wages for employed graduates in the engineering techniques group. There is then a further step up of more than a dollar to hourly wages for employed health graduates. The lowest paid group of graduates in both 1992 and 1995 are graduates in the arts aggregated field of studies.

Figure 4.15 **1992 and 1995 Median Hourly Wages of Trade-Vocational Graduates by Aggregated Field of Study**



Summary

In our view, the diversity of the trade-vocational educational system is the most striking point to emerge from the comparison above of aggregated trade-vocational fields of study. A first dimension of difference among the aggregated fields of study is differences in the characteristics of their graduates before enrolment. The most obvious difference is that the six field of study groups can be divided into four female-dominated groups (arts, business, health and social services and services) and two male-dominated groups (engineering techniques and primary industries).

Graduates in the female-dominated groups (with the exception of arts) tended to be older when they enrolled than graduates in the male-dominated groups. They also differed from the male-dominated groups in having a significant proportion of graduates with keeping house as their major activity before enrolment. Beyond these similarities, there are few, if any, of the characteristics discussed in this chapter which distinguish female-dominated aggregate fields of study as a group from male-dominated aggregate fields of study as a group.

One female-dominated field-dominated aggregate field of study—health—stands out as differing from the other fields of study in several ways. Health graduates have the highest educational levels before enrolment. They are the most likely to have paid for their own course of studies. They are the most likely to complete a further program after graduation, and among those who complete a further program, have the greatest proportion whose highest completed educational level increased from graduation to 1995. Health graduates have the lowest unemployment rates, highest employment rates, highest pay rates, and highest rates of use at work of the skills learned in their program.

Health graduates also have a very different distribution by occupational category than do graduates in the other occupational groups. Over 20% work in data occupations and over 70% work in service occupations. These are by far the highest proportions working in each of these occupational categories for any of the aggregate fields of study.

Perhaps the sharpest distinction between graduates in the various aggregated fields of study is their distribution by occupational category. This should not be surprising. Trade-vocational programs, by their nature, are meant to be oriented towards specific occupations. The results on skill use at work suggest that a high proportion of employed trade-vocational graduates in every field of study group work in jobs in which they use the skills acquired in their program. Thus graduates from occupationally specific programs in very different aggregated fields of study work in quite different occupations.

We have already characterised health graduates by the very high proportions who work in data and service occupations. Very high proportions of both engineering techniques graduates and primary industries graduates work in goods-producing occupations. The two groups are distinguished, however, by the high proportion of employed engineering techniques graduates

who work in skilled goods occupations and the significant proportion of engineering techniques graduates who are apprentices.

Employed graduates in the social services and services aggregated field of study and the arts aggregated field of study have similar distributions by occupational category. It is not difficult to find important dimensions of difference between graduates in these groups, however. Social services and services graduates are older at graduation than arts graduates and are less likely to have had school as their major activity before enrolment. They are much more likely to have had their course fees paid by government than are arts graduates and earn much more than arts graduates.

The business aggregated field of study has by far the highest proportion of employed graduates working in data manipulation occupations of any field of study group. It is also the only field of study group with a significant proportion of managers among its employed graduates.

A full characterization of the differences between the various aggregated fields of study would require a point-by-point examination of the differences between each pair of field of study groups. We will not undertake such an examination here. We hope that what we have said in this section gives a flavour of the diversity of the aggregated field of study groups. In the next chapter, we examine similarities and differences of graduates in the fields of study that make up the most important field of study groups.

5. Fields of Study and Occupational Specificity of Fields of Study

In Chapter 4, we compared the characteristics of trade-vocational graduates by aggregated COPS fields of study. In this chapter, we compare graduates in the individual COPS fields of study that make up a field of study group. For reasons of sample size, we limit our comparisons to the larger fields of study within the four largest field of study groups: business, health, engineering techniques and social services and services. At the end of this chapter, we take up the questions of the extent to which trade-vocational fields of study prepare their graduates for specific occupations and the relation for trade-vocational graduates between their occupation and their use of the skills acquired in their program.

5.1 Business Fields of Study

The business aggregated field of study contains eleven COPS fields of study and accounted for 28% of 1990 trade-vocational graduates. We divide the eleven COPS fields of study in the business aggregated field of study into three groups: administration, secretarial and computer Science. Table 5.1 below gives the percentage of business trade-vocational graduates in 1990 in each of these groups and in each of the eleven fields of study making up the business aggregated field of study.

Table 5.1 **Business Fields of Study**

Group	*COPS Field of Study*	*Percent*
Total Business		**100.0**
Administration		*39.2*
	Management and Administration—Business and Commerce	18.9
	Accounting	6.1
	Retail Sales	1.8
	Other Management and Administration	12.4
Secretarial		*51.5*
	Secretary—General	16.4
	Secretary—Legal	8.1
	Secretary—Medical	1.0
	Secretary—Word Processing	3.9
	Secretary—Accounting and Bookkeeping	8.4
	Other Secretarial and Clerical	13.7
Computer Science	Computer Science	*9.1*

There are considerable differences in the characteristics of graduates in these field of study groups, and, especially in the case of the administration group, in the fields of study within the group. Rather than attempting to describe graduates in each field of study in terms of a given set of characteristics, we will discuss what seem to us to be the most interesting differences among the field of study groups and between fields of study within the groups.

Gender, Age and Region of Residence

We begin with the gender distribution of graduates. Overall, women are 80% of 1990 graduates in the business aggregated trade-vocational field of study. Women are 94% of graduates in the secretarial group of fields of study, 71% in the administration group of fields of study and 43% of graduates in the computer science field of study.

The secretarial group is quite uniform in the gender composition of fields of study within the group, with 88% women in secretary—accounting and bookkeeping as the lowest percentage of women graduates in a field of study. The administration group is polarized between the accounting and other management and administration fields of study, each of which has women as 60% of its graduates, and the management and administration—business and commerce and retail sales fields of studies, where women are respectively 80% and 88% of graduates.

The age distribution of graduates in the business aggregated field of study had the highest proportion of graduates 33 years old or older and the lowest proportion of graduates 21 years old or less among the aggregated fields of study (Figure 4.3). The age distributions for the administration, secretarial and computer science groups of fields of study are similar to the overall distribution for the business aggregated field of study. Within the secretarial group, the legal secretary field of study had a markedly higher percentage of graduates 33 years old or older in June 1992 than the average for the group. (58% compared to 38%.)

Variation in the regional distribution of graduates before enrolment is such that it is meaningless to compare the field of study groups. To cite some examples, 40% of graduates in the management and administration—business and commerce field of study were from British Columbia, while 10% were from the Prairies region. In the other management and administration field of study, 26% of graduates were from the Prairies region and 18% from

British Columbia. One constant for the administration group of fields of study was a low percentage of graduates from Quebec.

In the secretarial group, 39% of graduates in the secretary—general field of study resided in the Prairies before enrolment, while 7% of graduates in the other secretarial and clerical field of study were from British Columbia. The proportion of secretary—general graduates who resided in Quebec was too small to be reported, while the 24% of other secretarial and clerical graduates were from Quebec. The regional distribution of trade-vocational computer science graduates before enrolment differed from the overall regional distribution of business graduates in that a much higher percentage of computer science graduates were from Ontario (36% compared to 24%) and a much lower percentage were from the Prairies. (6% compared to 19%.)

Education and Major Activity before Enrolment

Graduates in the secretarial fields of study had similar distributions of their highest level of schooling before enrolment, and these distributions are similar to the overall distribution for graduates in the business aggregated field of study. Graduates in all of the administration fields of study except other management and administration again had distributions of education level before enrolment which are similar to the overall distribution for the business aggregated field of study.

This leaves two fields of study, other management and administration and computer science. Pre-enrolment education levels in these fields were higher than the overall level in the business group. In the other management and administration field of study, 33% of trade-vocational graduates had a post-secondary degree, diploma or certificate before enrolment and 19% had a university degree, diploma or certificate (compared to 17% and 6% respectively of all graduates in the business aggregated field of study). In computer sciences, 13% of trade-vocational graduates had a community college diploma before enrolment (compared to 7% overall in the business aggregated field of study), 16% had a university degree, diploma or certificate (compared to 6% overall), and 38% had a post-secondary degree, diploma or certificate (compared to 17% overall).

In general, the distributions of major activities before enrolment of trade-vocational graduates in most business fields of study are similar to the overall distribution for the business field of study.

The most striking divergences are that 38% of secretary—general graduates had attending school as their major activity in the twelve months before enrolment (26% for business overall) and that 60% of computer science graduates were working before enrolment (44% overall).

Course Length and Payment of Fees

In the business aggregated field of studies, 15% of graduates completed courses whose normal length was 3-5 months, 70% completed courses of 6-12 months and 17% completed courses of more than a year. In the fields of study in the administration and secretarial groups, course length distributions were either very similar to this overall distribution, or had a somewhat greater concentration in the 6-12 months category, and a lesser concentration in the more than one year category, than the overall distribution.

The computer science field of study has a markedly different course length distribution from the business aggregated field of study, with much greater concentrations of both shorter and longer courses. The course length of 34% of trade-vocational computer science graduates was more than one year; the course length of 27% of these graduates was 3-5 months, leaving only 36% of trade-vocational computer science graduates with a course length of 6-12 months.

In the business aggregated field of studies, almost half of all graduates had at least part of their course fees paid by the federal government or a provincial government. In the administration group, 36% of graduates had their fees paid by government. In the computer science field of study, the percentage of graduates whose fees were paid by government was almost identical to the overall level for business graduates.

In the secretarial group, 58% of graduates had their course fees paid by government. This percentage varied widely among secretarial fields of study, from 40% for the secretary—general field of study to over 75% for the legal secretary and other secretarial and clerical fields of study.

Employment Rate and Skill Use

In 1992, the employment rate (employment-population ratio) of trade-vocational graduates in the administration group of fields of study was 77%, the employment rate of graduates in the secretarial group was 69% and the employment rate of computer science graduates was 71%.

The employment rate had risen for all three groups by 1995, to 80% for business graduates, 74% for secretarial graduates and 82% for computer science graduates.

In the secretarial group, graduates in the secretary—word processing and other secretarial and clerical fields of study had lower employment rates than those in other fields of study. The employment rate in both of these fields of study was 62% in 1992. In 1995, 67% of 1990 graduates in the secretary—word processing field of study were employed at interview, as were 69% of 1990 graduates in the other secretarial and clerical field of study.

Somewhat over 70% of employed 1990 graduates in the business aggregated field of study used the skills acquired in their course of study at work in 1992 and in 1995. The levels of skill use are highest among secretarial graduates, where they were 80% in 1992 and 77% in 1995, and lowest among computer science graduates, where they were 67% in both 1992 and 1995.

Occupational Category and Wage Rates

Nearly 60% of employed 1990 trade-vocational business graduates worked in data manipulation occupations in 1992. Over 10% worked in goods occupations, while 10% worked in management occupations. There are, however, significant divergences from this distribution in some of the business fields of study.

More than 60% of employed graduates in each of the secretarial fields worked in data manipulation occupations in 1992. Overall, 71% of employed secretarial graduates worked in data manipulation occupations, 7% worked in management occupations, and 7% worked in service occupations.

In the management and administration—business and commerce field of study, 14% of graduates worked as managers in 1992, while 56% worked in data manipulation occupations. In the other management and administration field of study, 20% of graduates worked as managers in 1992, while 39% worked in data manipulation occupations.

Finally, in the computer science field of study, only 24% of graduates worked in data manipulation occupations in 1992, 29% worked in data occupations and 21% worked in goods occupations. This COPS field of study includes courses in programming, in data processing, and

in computer technology. Programming is a data occupation; data processing occupations are likely to be data manipulation occupations. Goods occupations include repair and maintenance occupations which might well require skills learned in a computer technology course.

Table 5.2 gives median hourly wage rates in 1992 and in 1995 for business graduates in the administration, secretarial and computer science groups and for individual fields of study with at least 500 employed graduates in each year. Computer science graduates are clearly the best paid graduates in the business group, followed by other management and administration graduates. The secretarial fields of study have the lowest wage rates, with somewhat higher wage rates in the other secretarial and clerical field of studies than elsewhere in the secretarial group. The accounting field of study in the administration group has wage rates which are much more like those in the secretarial group than in the other fields of study in the administration group.

Table 5.2 **1992 and 1995 Wage Rates of Business Graduates**

Field of Study	***Median Hourly Wage***	
	1992	**1995**
Business	**10.58**	**12.29**
Administration	*11.22*	*12.98*
Management and Administration—Business and Commerce	10.99	12.65
Accounting	9.13	11.12
Other Management and Administration	12.15	15.18
Secretarial	*9.62*	*11.64*
Secretary—General	9.62	11.22
Secretary—Legal	9.89	12.64
Secretary—Accounting and Bookkeeping	9.62	11.21
Other Secretarial and Clerical	10.40	12.36
Computer Science	*13.46*	*15.38*

Summary

There is a wide range of differences between the various fields of study comprising the business trade-vocational aggregated field of study. Differences exist between the fields of studies in the administration and secretarial groups, as well as between the administration, secretarial and computer science groups of fields of study.

The most striking differences, in our view, are between the other management and administration field of study and the computer science field of study on the one hand and the other fields of study in the business group on the other hand. Graduates in other management and

administration and in computer sciences had much higher levels of education before enrolment than graduates from other fields of study. They had markedly different occupational distributions in 1992, with a significant proportion of employed graduates from the other management and administration field of study in management occupations and a significant proportion of computer science graduates in data occupations. They had much higher wage rates in both 1992 and 1995 than graduates in the other fields of study.

While there are differences between the fields of study in the secretarial group, there are considerable similarities as well, for example, in their gender composition, in their age and schooling before enrolment, in their occupational distribution and in their wages. There are much broader differences among fields of study within the administration group than within the secretarial group. One might characterize the business aggregate field of study of being made up of three very different groups of fields of study—a somewhat homogeneous secretarial group of fields of study, a quite heterogeneous administration group of fields of study, and the computer science field of study.

5.2 Health Fields of Study

The health trade-vocational aggregated fields of study accounted for 12% of 1990 trade-vocational graduates. There are four COPS fields of study in this group: nursing aide/orderly (50% of health graduates), other nursing (11% of health graduates), dental hygiene assistant/technician (17% of health graduates), and other health (22% of health graduates). Women are more than 95% of graduates in each of these fields of study except the other health field of study, where they are 70% of graduates.

There are striking differences between graduates in the other nursing field of study and graduates in the other three health fields of study. Graduates in other nursing are older (55% are 33 years or older at graduation, compared to 30% to 33% in the other health fields of study). Graduates in other nursing have by far the highest educational levels before study of any trade-vocational program. Of these graduates, 52% have a community college certificate or diploma and 66% have a completed post-secondary degree, diploma or certificate (including community college).

Job Futures (HRDC, 1998, p.202) states that students in other nursing receive training in psychiatric nursing, mental health nursing, public health nursing and dental nursing and that applicants are generally required to have a college diploma. The educational levels of graduates in the other nursing field of study would seem to confirm that these programs are in large part specialty training for nurses.

Given this, it is not surprising that other nursing graduates also differ strongly from other graduates in health fields of studies in their occupational distribution. Of other nursing graduates who were employed in 1992, 79% were employed in the data occupational category. This is by far the highest percentage of graduates employed in a skilled information occupational category.

Finally, as shown in Table 5.3, graduates in the other health field of study earn considerably more than graduates in the other trade-vocational health fields of study. Earnings levels in the other three health fields of study are very similar.

Table 5.3 **1992 and 1995 Wage Rates of Health Graduates**

Field of Study	***Median Hourly Wage***	
	1992	**1995**
Health		
Nursing Aide/Orderly	12.64	15.38
Other Nursing	16.67	19.23
Dental Hygiene Assistant/Technician	12.50	15.38
Other Health	12.44	14.17

In all of the health fields of study apart from other nursing, most graduates who were employed in 1992 worked in service occupations. In the nursing aide/orderly field of study, 79% of employed graduates worked in service occupations and 14% worked in data occupations. In the other health field of study, 63% of employed graduates worked in service occupations and 27% worked in data occupations. In the dental hygiene assistant/technician field of study, 93% of graduates worked in service occupations.

Aside from a greater concentration in service occupations, there are several ways in which the characteristics of graduates in the dental hygiene field of study differed from those of graduates in the nursing aide/orderly and other health fields of study. There were essentially no dental hygiene graduates who did not have at least a high school diploma before enrolment, while 14%

of nursing aide/orderly graduates and 20% of other health graduates did not have a high school diploma before enrolment.

Before enrolment, the major activity of 48% of dental hygiene graduates was attending school, while the highest percentage for any other health field of study was the 24% of other health graduates whose major activity before enrolment was attending school. The percentage (64%) of graduates in dental hygiene who paid their own course fees was much higher than in the other health fields of study (47% in other health was the next highest); and the percentage (17%) of dental hygiene graduates whose course fees were paid in full or in part by government was much lower than the percentage in the other health fields of study (39% in other health is the next lowest).

The regional distribution before enrolment of 1990 trade-vocational health graduates varies widely by field of study. The percentage of Ontario residents ranges from 68% for other health graduates to 28% for other nursing graduates. The percentage of Quebec residents is too small to report for every health field of study except other nursing, where it is 30%. The percentage of British Columbia residents is too small to report in the other nursing and other health fields of study, and somewhat over 20% in the nursing aide/orderly and dental hygiene fields of study. The percentage of residents of the Prairies is 18% for the other health field of study and somewhat over 25% for the other three fields of study.

Despite the differences we have discussed above, there are broad areas of similarity among trade-vocational fields of study in health. Graduates in the health aggregated field of study had the highest employment rates (employment-population ratios) for any of the aggregated fields of study in both 1992 and 1995, close to 90% in both years. (Figure 4.12) There are only small differences in employment rates among the health fields of study.

The health aggregated field of study also had the highest percentage of graduates who completed a further course by 1995 (33%, Figure 4.9) and the highest percentage among those completing a further course for whom this resulted in an increase in their highest level of study (63%, Figure 4.10). The corresponding percentages for the various health fields of study are quite close to these levels.

Employed health graduates also had the highest rates for any aggregate trade-vocational field of study of using the skills learned in their program at work. This is true for both graduates employed in 1992 (90% skill use) and graduates employed in 1995 (85% skill use). Skill use rates for the various health fields of study are almost identical to these averages in both years (except that 92% of employed dental hygiene graduates used the skills learned in their program at work in 1995).

Summary

The most striking differences among the trade-vocational health fields of study are between the other nursing field of study on the one hand and the other three fields of study on the other. To cite two areas of difference, graduates in other nursing had higher education levels before enrolment and worked predominantly in data occupations in 1992. The dental hygiene aide/technician field of study differs from the other three health occupations in having proportionately more graduates whose major activity before enrolment was attending school, proportionately more who paid their own course fees and proportionately more who worked in service occupations in 1992.

There is a wide range of differences among the health fields of study in the pre-enrolment regional distribution of graduates. These differences may be due in large part to institutional differences among the provinces in the courses required to enter various health occupations.

There is also a broad range of similarities among graduates in the various health fields of study. Perhaps the most important is the very high proportion of female graduates in all of these fields of study. Health graduates in the various fields of study are also similar in having high levels of further completed studies after graduation and in having high employment rates and high levels of use of the skills learned in their course of study.

5.3 Engineering Techniques

The engineering techniques aggregated field of study accounted for 36% of trade-vocational graduates in 1990. Men were 90% of graduates in this aggregate field of study and were at least 70% of graduates in each of the fields of study making up this aggregated field of study (with the

exception of two fields of study which are too small to report). Table 5.4 shows the distribution of 1990 engineering techniques graduates by COPS field of study.

Table 5.4 **Engineering Techniques Fields of Study**

COPS Field of Study	*Percent*
Total Engineering Techniques	*100.0*
Electrical and Electronic Engineering Technician	14.6
Other Electrical and Electronic	2.6
Transportation Technician	4.0
Total Mechanics	*32.7*
Agricultural Equipment Mechanic	—
Automobile Mechanic	7.5
Auto Body Repair	1.5
Heavy Equipment Mechanic	10.7
Other Mechanical Engineering	12.3
Architectural Design/Drafting Technician	—
Construction Technician	16.5
Welding Technician	9.7
Other Architectural and Construction Technician	—
Manufacturing Technician	2.4
Machinist	7.1
Other Industrial Engineering Technician	1.8
Civil Technologies	—
Drafting	3.6
Other Engineering	3.9

In what follows, we will compare graduates from the electrical and electronic engineering technician, construction technician, welding technician and machinist fields of study and graduates from the combined mechanics field of study. These groups constitute over 80% of 1990 trade-vocational graduates in engineering techniques. On occasion, we will discuss differences between the fields of study in the mechanics field of study group.

Gender, Age, Education, Region of Residence and Major Activity Before Enrolment

Almost all 1990 graduates in these fields of study were men. Of graduates in the mechanics group, 96% were men; and there is no field of study in this group with sufficient enrolment to report where men were less than 90% of graduates. Only two of the fields of study in our list of the preceding paragraph had less than 90% men among their 1990 graduates—electrical and electronic engineering technicians where men were 89% of graduates and construction technicians, where men were 86% of graduates.

The age distributions of graduates in all of these fields of study were generally similar to the overall distribution for the engineering techniques aggregated field of study. Their educational distribution before enrolment was also similar to the overall distribution for engineering techniques, although a somewhat higher percentage (27%) of graduates in construction techniques were not high school graduates before enrolment than was the case for the overall engineering techniques aggregated field of study (19%). There was considerable variability among fields of studies in mechanics in the educational level at enrolment, as the percentage with less than high school was at about the overall level for auto mechanics, well below this level for the other mechanical engineering field of study, and well above for all of the other fields of study in the mechanics group.

The over-representation of Ontario and the under-representation of British Columbia among graduates from the machinist field of study is the only striking difference between the regional distribution before enrolment of all graduates in the engineering techniques group and graduates in one of the fields of study we are examining here. Quebec and Ontario residents are somewhat under-represented, and residents of British Columbia somewhat over-represented among graduates in auto mechanics; residents of the Atlantic region and the Prairies are somewhat under-represented and residents of British Columbia somewhat over-represented among graduates in heavy equipment mechanics.

The distributions by major activity before enrolment of 1990 graduates in the fields of study we are considering are all very similar to the overall distribution for engineering techniques with one exception. Graduates in auto mechanics were much more likely to have attending school as their major activity before enrolment (41% of graduates in auto mechanics versus 23% of all engineering techniques graduates).

Payment of Fees and Apprenticeship

In general, the percentage of graduates in these fields of study who had their course fees paid entirely or in part by the federal or a provincial government was similar to the overall percentage for the engineering techniques aggregated field of study (45%). A much higher percentage (68%) of machinist graduates, however, had their fees paid by government than the overall level for the engineering techniques group.

We noted in Chapter 4 that about 80% of 1990 trade-vocational graduates who were registered apprentices in 1992 were graduates from fields of study in the engineering techniques group. Overall, 23% of 1990 engineering techniques graduates were registered apprentices in 1992. All of the field of studies considered here, except those in mechanics, had percentages of registered apprentices which were close to the overall level for engineering techniques.

In the fields of study in mechanics, the percentage of 1990 graduates who were registered apprentices in 1992 was 29%. In the automobile mechanics field of study, 42% of graduates became registered apprentices, while in the other mechanical engineering field of study, only 20% of graduates became registered apprentices. In the heavy equipment mechanics field of study, 30% of 1990 graduates were registered apprentices in 1992.

Employment and Hourly Wage

The 1992 employment rate (employment-population ratio) of 1990 trade-vocational graduates in the engineering techniques aggregated field of study was 76%. For the fields of study considered here, the highest employment rates were for the mechanics fields of study (81% overall, with 84% for other mechanical engineering, 80% for auto mechanics and 78% for heavy equipment mechanics) and the lowest were for welding technicians (70%), construction technicians (71%) and machinists (73%) fields of study. By 1995, the overall employment rate for graduates in engineering techniques had increased to 81%. The field of study differences in the rate were much the same as in 1992, except that graduates in the machinist field of study now had one of the highest employment rates (85%) of any of these fields of study.

Table 5.5 shows the percentage of employed engineering techniques graduates in various fields of study who worked as skilled goods workers and as other goods workers in 1992. Overall, 73% of employed engineering graduates worked as skilled goods workers and other goods workers. For the fields of study, this percentage ranges from 71% for construction techniques graduates to over 80% for all groups of mechanics.

The most interesting differences in Table 5.5 are in the distribution between skilled goods workers and other goods workers for the various fields of study. Three fields of study have over forty percent of their employed graduates working in skilled goods occupations: electrical and electronic engineering technician (48%), machinist (45%) and heavy equipment mechanic (42%).

Among machinist and heavy equipment graduates, the proportion working as other goods workers is somewhat lower than the proportion working as skilled goods workers. For electrical and electronic engineering technicians, the proportion working as skilled goods workers is more than double the proportion working as other goods workers.

The highest percentage of graduates working as other goods workers is among graduates in automobile mechanics field of study (72%) and the welding technicians field of study (70%).[33] Very few graduates in either field of study work as skilled goods workers (12% for auto mechanics and 10% for welding techncian). The other fields of study with more other goods workers than skilled goods workers are other mechanical engineering and construction technician.

Table 5.5 1992 Occupational Category of Employed Engineering Techniques Graduates

COPS Field of Study	*Percentage Employed in*	
	Skilled Goods	**Other Goods**
Total Engineering Techniques	*30.3*	*42.4*
Electrical and Electronic Engineering Technician	48.2	21.6
Total Mechanics	*30.3*	*51.7*
Automobile Mechanic	12.0	72.4
Heavy Equipment Mechanic	42.3	41.7
Other Mechanical Engineering	32.2	45.7
Construction Technician	29.7	41.9
Welding Technician	9.1	69.7
Machinist	44.5	38.3

Table 5.6 gives the median hourly wage in 1992 and in 1995 of 1990 trade-vocational graduates in engineering techniques. Graduates in automobile mechanics have the lowest wage rates, followed by graduates in the construction technician field of study. Graduates in other

[33] Motor vehicle mechanics and repairers (SOC 8581) are classified in the other goods occupational category in the occupational groupings used here. This explains the high proportion of graduates in this group who are classified as other goods workers. Most of the other occupations in the minor group 858, mechanics and repairers, not elsewhere classified, were classified in the skilled goods category on the basis of discriminant analysis of the characteristics of the occupation. The discriminant analysis did not suggest that the classification of motor vehicle mechanics and repairers was inappropriate. The scores used in the discriminant analysis are based on the CCDO, which dates from the early 1970's. It is possible that the skill levels of the motor vehicle mechanics and repairers occupations have risen since this time, and that the occupation would more appropriately be classified as a skilled goods occupation. On the other hand, the wage rates for graduates in automobile mechanics are much lower than for graduates in heavy equipment mechanics and in other mechanical engineering, possibly suggesting lower skill levels for automobile mechanics.

mechanical engineering have the highest wage rates. Graduates in the machinist field of study have 1992 wages which are considerably below the level for the entire aggregated field of study and 1995 wages which are somewhat higher than the overall level. Electrical and electronic engineering technician graduates, heavy equipment mechanic graduates and welding technician graduates all have median 1992 wages which are identical to the median for the overall engineering techniques group. In 1995, heavy equipment mechanics have the highest wage rate of any field of study, electrical and electronic engineering graduates have a median wage identical to the median for the overall engineering techniques group, and welding technician graduates have a wage rate considerably below the overall median.

Table 5.6 **1992 and 1995 Wage Rates of Engineering Techniques Graduates**

COPS Field of Study	*Median Hourly Wage*	
	1992	*1995*
Total Engineering Techniques	*11.54*	*14.17*
Electrical and Electronic Engineering Technician	11.54	14.17
Total Mechanics	*11.33*	*14.42*
Automobile Mechanic	8.55	12.02
Heavy Equipment Mechanic	11.54	16.64
Other Mechanical Engineering	13.46	15.38
Construction Technician	10.58	13.19
Welding Technician	11.54	13.46
Machinist	10.58	14.42

Summary

The engineering techniques graduate group of field of study is much more homogeneous in terms of the background of its graduates than the business and health groups we examined above. Graduates in the fields of studies we examined are similar in their gender, age, education before enrolment, regional distribution before enrolment and distribution by major activity before enrolment (except for auto mechanics). They are also similar in the proportion who had their course fees paid by government.

Of 1990 trade-vocational graduates who were registered apprentices in 1992, 80% came from the engineering techniques aggregated field of study. In the engineering techniques group, 23% of graduates were registered apprentices in 1992. The percentage of registered apprentices among graduates was at about this level for all the fields of study we considered except those in mechanics. Overall in fields of study in mechanics, 29% of graduates were registered

apprentices; in the automobile mechanic field of study, 42% of graduates were registered apprentices.

The clearest differences among graduates in the different fields of study in this group was in their labour market experience after graduation. There are significant differences in employment rates by field of study, with mechanics generally having the highest employment rates. There is also considerable variation among these fields of study in the median wage rates of their graduates in 1992 and in 1995, with automobile mechanics graduates having by far the lowest median wage in each of these years.

Over 70% of employed 1992 graduates worked as skilled goods workers or as other goods workers in every field of study considered, but there were significant differences by field of study in the breakdown between skilled goods workers and other goods workers. Three fields of study (electrical and electronic engineering technician, machinist, heavy equipment mechanic) have more skilled goods workers than other goods workers among their graduates. Four others (automobile mechanics, welding technician, construction technician and other mechanical engineering) have more other goods workers than skilled goods workers among their graduates.

5.4 Social Service and Service

The trade vocational social service and service aggregated field of study lumps together a diverse set of fields of study: social services, other social sciences, cooking, other food preparation and other service. The social services and other social sciences each have women as more than 80% of their 1990 graduates (89% for social services and 81% for other social sciences); while 46% of cooking graduates, 50% of food preparation graduates and 58% of other service graduates are women.

Table 5.7 **Social Service and Service Fields of Study**

COPS Field of Study	*Percent*
Total Social Service and Service	*100.0*
Social Service	32.9
Other Social Science	27.1
Cooking	23.3
Other Food Preparation	4.8
Other Service	11.9

Table 5.7 gives the distribution of social service and service graduates in 1990 by field of study. The female-dominated social services and other social science fields of study account for 60% of graduates in the field of study group, the cooking and food preparation fields of study account for 28%, and the other services field of study account for the remaining 12%. In most of what follows, we will compare graduates in the three largest fields of studies: social services, other social sciences and cooking.

Age, Education, Region of Residence and Major Activity before Enrolment

Broadly speaking, the age distributions of graduates in these three fields of study are all similar to the overall distribution among social service and service graduates. The other social science field of study has the highest percentage of graduates 21 years or younger at graduation (40%), while social services has the lowest percentage (27%). Cooking has the lowest percentage of graduates 33 years old or older (25%); both social service and other social science have 33% of their graduates in this age group.

The educational distribution of 1990 social service graduates before enrolment is almost identical to that of the aggregated social service and service field of study. The other social science field of study has the highest percentage of graduates with some education beyond high school before enrolment. In particular, 18% of graduates in this field of study had completed a community college diploma or certificate.

In the aggregated social service and service field of study, 38% of 1990 graduates resided in British Columbia before enrolment. This represents an average of two extremes: 23% of graduates in the cooking field of study were British Columbia residents and over 40% of graduates in the social services and other social science fields of study were British Columbia residents. Quebec residents were 16% of graduates in cooking and 6% of graduates in social services (compared to 10% of graduates in the aggregated social service and service field of study).

The distributions of graduates by major activity before enrolment in the other social science field of study and in the cooking field of study were very similar to the distribution for the social service and service group. Graduates in the social service field of study were more likely to be

keeping house (18%, compared to 12% overall) and less likely to be attending school (19%, compared to 25% overall).

Study Period, Payment of Course Fees and Apprenticeship

Much lower percentages of graduates in cooking (7%) and in other social sciences (10%) had courses of 3-5 months duration than was the case for graduates in social service (31%). Of graduates in other social science, 30% had courses of more than a year's duration, compared to somewhat less than 20% for both social service graduates and cooking graduates.

The percentage of 1990 graduates whose course fees were paid by government in whole or in part ranged from 28% in the other social science field of study to 40% in the social service field of study to 50% in the cooking field of study.

Outside of the cooking field of study, there were very few apprentices in the social service and service aggregated field of study. In the cooking field of study, 22% of 1990 graduates were registered apprentices in 1992, approximately the same percentage as the percentage of apprentices among graduates in the engineering techniques group.

Employment, Occupational Category, Skill Use and Wages

The employment rates (employment-population ratios) in 1992 and in 1995 of 1990 graduates in the social service and other social science fields of study were over 80%. Employment rates in the cooking field of study were lower at 74% in each year.

In the other social science field of study, 49% of employed 1990 graduates worked in data occupations in 1992. As a percentage of graduates in a field of study employed in skilled information occupations, this is second only to the other nursing field of study. Another 26% of graduates in other social science worked in service occupations, while 16% worked in data manipulation occupations.

In the social service field of study, 57% of employed 1990 graduates worked in service occupations in 1992 and 29% worked in data occupations. Among cooking graduates, 65% worked in other goods occupations (which includes cooks) and 17% worked in service occupations.

Among employed graduates in the social service field of study, 92% used the skills acquired in their course of study at work in 1992 and 84% used these skills at work in 1995. In the other social science field of study and in the cooking field of study, slightly less than 75% of employed graduates used the skills acquired in their trade-vocational program at work in 1992; in 1995, 75% of both groups used the skills acquired in their program at work.

Table 5.8 gives the median wage in 1992 and 1995 of employed graduates in the social service and service group by field of study. Cooking graduates are clearly the lowest paid group. Other social science graduates earned considerably less than social service graduates in 1992, but this difference had disappeared by 1995.

Table 5.8 **1992 and 1995 Wage Rates of Social Service and Service Graduates**

COPS Field of Study	*Median Hourly Wage*	
	1992	**1995**
Total Social Service and Service	*10.26*	*12.02*
Social Service	11.54	12.65
Other Social Science	10.44	12.82
Cooking	9.01	10.77

Summary

Of the three fields of study considered here, one, cooking, is markedly different from the other two. Men are a majority of graduates in cooking and are less than 20% of graduates in the other two fields of study. A significant percentage of 1990 cooking graduates were registered apprentices in 1992. Cooking graduates were less likely to be employed in 1992 than graduates in the other two fields of study and earned significantly less when they were employed.

Cooking graduates worked predominantly in other goods occupations; social service and other social science graduates worked predominantly in data occupations and service occupations. One notable difference between graduates in social service and graduates in other social science is the much higher proportion of the latter group who worked in data occupations.

5.5 Occupational Specificity of Trade-Vocational Fields of Study

Trade-vocational programs are in principle relatively short courses of study which prepare their graduates for an apprenticeship or for work in a specific occupation. In this subsection, we examine the extent to which graduates from the fields of study we discussed in the preceding

subsections find work in occupations related to their studies. We also consider how narrow or broad is the range of occupations in which graduates from these fields of study find work. Finally, we examine the relation between the occupation of employment and skill use on the job for graduates in the various fields of study.

Table 5.9 gives for selected fields of study the occupational concentration in 1992 in selected major groups of occupations and in selected occupations of employed 1990 trade-vocational graduates. The occupations shown for each field of study are the most important sources of employment for graduates in the field of study. All of the fields of study shown are drawn from the four broad groups discussed in the preceding subsections of this chapter. Some fields of study and some occupations within fields of study are not reported in the table because of insufficient sample size.

The table shows that in every field of study, graduates are most heavily concentrated in occupations which are related to their field of study. Fields of study vary greatly, however, in the percentage of graduates who worked in related occupations. The health group of fields of study has the highest percentage of graduates employed in related occupations since at least 80% of employed graduates in each field of study worked in the medicine and health major group. The health group is also the most uniform in the percentage of graduates employed in related occupations.

In other field of study groups, there is much more variability within the group in the percentage of graduates who worked in related occupations. For all business fields of study, the largest major group of employment is clerical and related occupations. In the administration subgroup, managerial, administrative and related occupations are also an important source of employment. The percentage of graduates employed in the principal major groups of employment for their field of study ranges from 76% of graduates in the secretary—general field of study employed in clerical and related occupations down to 27% of graduates in the computer science field of study employed in clerical and related occupations.

In the engineering techniques fields of study, the concentration of graduates in employment in related major occupational groups goes from 60% of graduates in auto mechanics who worked in product fabricating, assembling and repairing occupations down to 41% of machinists who

worked in machining and related occupations. In the social service and service fields of study, 72% of cooking graduates worked in service occupations, while 16% of graduates in other social sciences worked in social sciences and related occupations and 27% worked in teaching and related occupations.

The table also shows that graduates in some fields of study are heavily concentrated in one or two occupations. This is especially true in the health fields of study. In the nursing aide/orderly field of study, 47% of employed graduates worked as registered nursing assistants in 1992 and 16% worked as nursing attendants. In the other nursing field of study, 77% of employed graduates worked as registered nurses in 1992. In the dental hygiene assistant technician field of study, 91% of employed 1990 graduates worked as dental hygienists and dental assistants in 1992.

Table 5.9 **Major Group and Occupational Distribution of Graduates by Field of Study**

COPS Field of Study	*Field of Study (%)*
Business Fields of Study	
Administration Group	
Management and Administration—Business and Commerce	
11 Managerial, Administrative and Related	20.1
41 Clerical and Related	54.0
4111 Secretaries and Stenographers	20.6
Accounting	
41 Clerical and Related	36.9
Other Management and Administration	
11 Managerial, Administrative and Related	32.2
41 Clerical and Related	32.5
Secretarial Group	
Secretary—General	
41 Clerical and Related	72.9
4111 Secretaries and Stenographers	20.6
Secretary—Legal	
41 Clerical and Related	74.6
4111 Secretaries and Stenographers	41.5
Secretary—Word Processing	
41 Clerical and Related	76.1
Secretary—Accounting and Bookkeeping	
41 Clerical and Related	60.1
Other Secretarial and Clerical	
41 Clerical and Related	63.6
4111 Secretaries and Stenographers	28.4

Table 5.9 **(continued)**

Computer Science Group	
Computer Science	
41 Clerical and Related	26.8
Health Fields of Study	
Nursing Aide/Orderly	
31 Medicine and Health	80.5
3131 Registered Nurses	11.7
3134 Registered Nursing Assistants	47.0
3135 Nursing Attendants	15.6
61 Service Occupations	12.1
Other Nursing	
31 Medicine and Health	87.8
3131 Registered Nurses	77.3
Dental Hygiene Assistant/Technician	
31 Medicine and Health	94.3
3158 Dental Hygienists and Dental Assistants	91.0
Other Health	
31 Medicine and Health	84.4
3139 Nursing, Therapy and Related Assisting, n.e.c.	43.9
Engineering Techniques Fields of Study	
Electrical and Electronics Technicians	
85 Product Fabricating, Assembling and Repairing	35.2
87 Construction Trades	20.0
Mechanics Group	
Auto Mechanics	
85 Product Fabricating, Assembling and Repairing	59.9
8581 Motor Vehicle Mechanics and Repairers	48.4
Heavy Equipment Mechanics	
85 Product Fabricating, Assembling and Repairing	46.5
8584 Industrial, Farm and Construction Machinery Mechanics	32.6
Other Mechanical Engineering	
85 Product Fabricating, Assembling and Repairing	29.7
95 Other Crafts and Equipment Operating	18.5
Construction Technicians	
85 Product Fabricating, Assembling and Repairing	16.6
87 Construction Trades	38.4
8781 Carpenters	15.9
Welding Technicians	
83 Machining and Related	53.2
8335 Welding and Flame Cutting	51.8
Machinists	
83 Machining and Related	41.3
Social Service and Service Fields of Study	
Social Service	
27 Teaching and Related	20.2
31 Medicine and Health	40.6
3135 Nursing Attendants	2.7
61 Service	21.3

Table 5.9 **(continued)**

Other Social Science	
23 Social Sciences and Related	15.9
27 Teaching and Related	26.5
2731 Elementary and Kindergarten Teachers	13.8
61 Service	23.5
Cooking	
61 Service	71.5
6121 Chefs and Cooks	56.1
Other Service	
61 Service	57.6

There are other instances of occupational specificity for certain fields of study. Among employed 1990 cooking graduates, 56% worked as chefs and cooks in 1992. Of welding technician graduates in 1990, 52% worked in welding and flame cutting in 1992. Among legal secretary graduates, 42% worked as secretaries and stenographers in 1992.

From Table 5.9 it is clear that the most important occupations of employment for graduates in trade-vocational fields of study are related to the field of study, although the degree to which graduates are concentrated in these occupations varies widely by field of study. Table 5.10 examines the relation for employed trade-vocational graduates between their occupation and their use of the skills learned in their course of study.

For each field of study, the table compares the percentage of employed graduates who use the skills learned in their program among graduates employed in the predominant major occupational groups shown in Table 5.9 and among graduates who are employed in other occupations. For example, for the management and administration—business and commerce field of study, 93% of graduates employed in managerial, administrative and related occupations and 90% of those employed in clerical and related occupations use the skills learned in their program at work. The percentage of graduates in this field of study who use the skills used in their program at work falls to 60% for graduates employed in occupations outside of these two major groups.

In every field of study for which both figures can be reported, the percentage of graduates who use their skills at work is much higher among those working in occupations in the major occupational groups in which graduates in the field of study are concentrated than among those working in other occupations. In many fields of study, graduates working in occupations in the major related groups have skill use rates of 90% or more; in many others 80% or more.

There are only two fields of study in which graduates working in one of the principal major occupational groups have skill utilization rates below 70%. These are: the other management and administration field of study, where graduates working in occupations in the clerical and related major group have a 67.5% skill utilization rate (but those working in occupations in the managerial, administrative and related occupations group have a 93.8% skill utilization rate); and the other social science field of study, where those working in occupations in the service major group have a 68.4% skill utilization rate (but those working in the social science and related major group and in the teaching and related major group have skill utilization rates of 90.6% and 99.2% respectively.

In contrast, skill utilization rates are much lower for trade-vocational graduates working outside the major occupational groups where graduates from their field of study are concentrated. These rates are below 67.5% (the lowest rate cited in the preceding paragraph) in all but two instances (a skill utilization rate of 71.1% for legal secretary graduates working outside the clerical and related major group and a skill utilization rate of 69.3% for computer science graduates working outside the clerical and related major group). They are above 60% in only two other fields of study (other secretarial and clerical and other mechanical engineering), and drop as low as 36.3% for electrical and electronics technician graduates.

Table 5.10 **Graduates' Use at Work of Skills Learned in Course by Field of Study**

COPS Field of Study	*(%) Using Skills*
Business Fields of Study	
Administration Group	
Management and Administration—Business and Commerce	
11 Managerial, Administrative and Related	92.5
41 Clerical and Related	90.2
All Other Occupations	59.9
Accounting	
41 Clerical and Related	72.0
All Other Occupations	50.2
Other Management and Administration	
11 Managerial, Administrative and Related	93.8
41 Clerical and Related	67.5
All Other Occupations	47.1
Secretarial Group	
Secretary—General	
41 Clerical and Related	91.1
All Other Occupations	58.1

Table 5.10 **(continued)**

Secretary—Legal	
41 Clerical and Related	83.6
All Other Occupations	71.1
Secretary—Word Processing	
41 Clerical and Related	79.9
All Other Occupations	—
Secretary—Accounting and Bookkeeping	
41 Clerical and Related	83.9
All Other Occupations	56.4
Other Secretarial and Clerical	
41 Clerical and Related	88.2
All Other Occupations	66.3
Computer Science Group	
Computer Science	
41 Clerical and Related	—
All Other Occupations	69.3
Health Fields of Study	
Nursing Aide/Orderly	
31 Medicine and Health	93.0
61 Service Occupations	78.0
All Other Occupations	—
Other Nursing	
31 Medicine and Health	96.0
All Other Occupations	—
Dental Hygiene Assistant/Technician	
31 Medicine and Health	92.0
All Other Occupations	—
Other Health	
31 Medicine and Health	95.8
All Other Occupations	—
Engineering Techniques Fields of Study	
Electrical and Electronics Technicians	
85 Product Fabricating, Assembling and Repairing	81.8
87 Construction Trades	79.8
All Other Occupations	36.3
Mechanics Group	
Auto Mechanics	
85 Product Fabricating, Assembling and Repairing	89.5
All Other Occupations	—
Heavy Equipment Mechanics	
85 Product Fabricating, Assembling and Repairing	90.0
All Other Occupations	42.8
Other Mechanical Engineering	
85 Product Fabricating, Assembling and Repairing	74.0
95 Other Crafts and Equipment Operating	99.0
All Other Occupations	63.9
Construction Technicians	
85 Product Fabricating, Assembling and Repairing	80.4
87 Construction Trades	80.0
All Other Occupations	45.8

Table 5.10 **(continued)**

Welding Technicians	
83 Machining and Related	92.3
All Other Occupations	—
Machinists	
83 Machining and Related	86.4
All Other Occupations	45.0
Social Service and Service Fields of Study	
Social Service	
27 Teaching and Related	100
31 Medicine and Health	100
61 Service	92.4
All Other Occupations	65.8
Other Social Science	
23 Social Sciences and Related	90.6
27 Teaching and Related	99.2
61 Service	68.4
All Other Occupations	51.8
Cooking	
61 Service	85.7
All Other Occupations	—
Other Service	
61 Service	87.1
All Other Occupations	61.6

Summary

In all of the fields of study considered, employed graduates are concentrated in occupations in one to three major groups. On inspection, the content of work in occupations in these major groups appears closely related to the program content in the field of study. The degree of concentration in major groups of occupations varies considerably among fields of study. It is very high in the health fields of study. For some fields of study, there is also considerable concentration of employed graduates in a single occupation. Once again, the health fields of study furnish the most striking instances, although there are examples in every field of study group.

In every field of study, graduates who work in occupations in the related major groups are more likely to use the skills acquired in their programs at work than those who work in occupations outside these major groups. The rate of skill use in the related major groups varies by field of study. For some fields of study it is more than 90%. In many fields of study, a lower, but still significant, portion of graduates who work in occupations outside the related major groups nonetheless use the skills acquired in their program at work.

6. Conclusion

The emphasis of this study has been on differences: differences between graduates at the trade-vocational level on the one hand, and graduates at the community college and undergraduate levels on the other hand, but above all, differences among trade-vocational graduates. The trade-vocational educational system, as reflected in the NGS, is highly diverse. At the extremes, it trains persons without a high school diploma as cooks and trains persons who are already registered nurses in nursing specializations. Even at an aggregated field of study level it can be divided into male-dominated and female-dominated groups of fields of study.

In general, trade-vocational graduates are less likely to be employed than graduates at other levels, earn less when they are employed, and are less likely to use their skills at work. It should be pointed out, however, that trade-vocational graduates take much shorter programs of study than other graduates and that many of them have all or some of their course fees paid by government. If the rewards of trade-vocational programs are less, the costs are less as well. Also, many of these generalizations about trade-vocational education are not true for particular fields of study.

Employed trade-vocational graduates in all of the fields of study examined in Chapter 5 show significant occupational concentration, at least at the major group level, and sometimes at the level of a single occupation. When examined, the occupations where graduates from a field of study are concentrated are related to their program content. Graduates working in these appropriate occupations are much likelier to use the skills acquired in their program at work than are those working in other occupations (although even those working in other occupations have significant levels of skill use).

It is difficult to avoid the conclusion that trade-vocational graduates have acquired skills in their program which are useful to them in the labour market. Those for whom the skills acquired in their program are most useful are those who are working in occupations related to their course. Other trade-vocational graduates may not use the skills learned in their program. It is worth re-emphasising, however, that the social and private costs of unused skills are less for three month to one year trade-vocational programs than for community college or BA programs. The social

and private costs which result when a person trains as a cook and works as a taxi driver are less than those which result when another person trains as a BA in communications and works as a taxi driver.

In this connection, it is worth mentioning that in 1995, 71% of employed 1990 trade-vocational graduates used the skills acquired in their program on the job. This is lower than the 78% of employed 1990 BA graduates who reported using the skills learned in their program on the job in 1995, but not dramatically lower.

Above and beyond the diversity of the trade-vocational programs covered by the NGS, which we discussed in Chapters 4 and 5, there are considerable differences between the NGS and other sources as to what constitutes trade-vocational, vocational, trades, technical or career education. (The last two terms are usually reserved for community college career programs.) Chapter 2 examined a series of definitions of trade-vocational education drawn from different sources. One common point of these definitions are that all of them are operational, establishing decision rules as to who ought to be considered a trade-vocational student. None of them seems to refer to a general classification of the components of the educational and training system.

In what follows, we will propose such a classification, then describe how trade-vocational education fits into this classification. We will then draw conclusions for how trade-vocational education should be treated in various surveys, in particular, in the NGS.

We begin by saying that we are not convinced that the concept of vocational education should be limited to non-university education. In our view, vocational education is education aimed at preparing students for a specific occupation or limited group of occupations. General education gives students skills which are useful in a broad range of occupations or in learning further skills. In this perspective, a university program in medicine or in engineering is largely vocational, as is a trade-vocational program in cooking. Obviously, the university programs have a larger component of general skills and much higher levels of occupationally specific skills than does the trade-vocational program.

Education should be distinguished from training. Education provides either general skills or the broad range of skills required for an occupation or group of occupations (or both); training

provides a single set of specific skills. Obviously the boundary is not always easily drawn; nonetheless, we think the distinction significant. When physicians receive instruction in the use of a new diagnostic device they are receiving training; when students go through medical school, they are participating in an educational program with a large vocational component.

As is conventional, we distinguish three broad levels of education: primary, secondary and post-secondary. Primary education is exclusively concerned with general skills. Secondary education requires completion of primary education or the equivalent. Secondary education may be exclusively general or may have a vocational component. Programs with a vocational component are those leading to a high school diploma which also provide preparation for a specific occupation or group of occupations.

Post-secondary education requires completion of high school or the equivalent. It includes both programs which are exclusively general education and others with a strong vocational component. In Canada, it is provided in universities, community colleges (including CEGEPs), and some private colleges and specialized institutions.

Table 6.1 gives what we see as the appropriate relation between levels of education and survey instruments aimed at describing labour market outcomes and other outcomes for students at each of these levels. In this framework, the National Graduates Survey would be limited to programs which normally require secondary school completion and are given in universities, colleges or equivalent institutions. Vocational high school programs would not be included in the coverage of the NGS.

Table 6.1 **Levels of Education and Survey Instruments**

Level	*Requirement*	*Survey Instrument*
Training	Varies	Adult Education and Training Survey, Apprenticeship Survey, Surveys based on administrative training files frame, Workplace and Employees Survey
Education: Secondary (Vocational and General)	Primary	Youth in Transition, National Longitudinal Survey of Children and Youth
Education: Post-Secondary— Community College and University (Vocational and General)	Secondary	National Graduates Survey

This proposed modification of the National Graduates Survey would mean that its sample would be drawn entirely from administrative records of universities, community colleges and equivalent institutions. In any event, with the devolution of training programs to the provinces, it will become increasingly difficult to supplement the sample from training records. The sample also would be limited to programs which require high school graduation or the equivalent.

In our view, it is often difficult to distinguish between community college level courses and trade-vocational level courses with similar subject matter, especially as the trade-vocational courses may last more than a year or may be a prerequisite to a further college course. We would therefore drop the distinction between trade-vocational courses and community college courses, while retaining the requirement of a minimum course length of three months. This is the same conclusion as that reached by Oderkirk and Skof (1997, p.10).

It might then be desirable to stratify the college sample on the basis of course length. Questions probing whether the program is a prerequisite for further studies or whether earlier programs were prerequisites for the program of graduation should also be added.

The classification of education we propose also has implications for how data is collected in other surveys. In our view, when respondents in the Census and in the Labour Force Survey are asked whether they have trades certificates or diplomas they should also be asked whether these certificates or diplomas normally required high school graduation and at least three months of full-time study in a post-secondary institution. This would avoid the current situation in which the Labour Force Survey potentially is recording as post-secondary education one-day word processing certificates granted to persons who have not graduated from high school.

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